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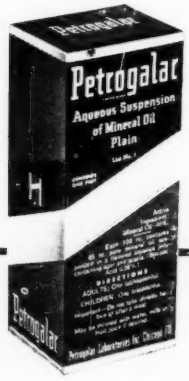

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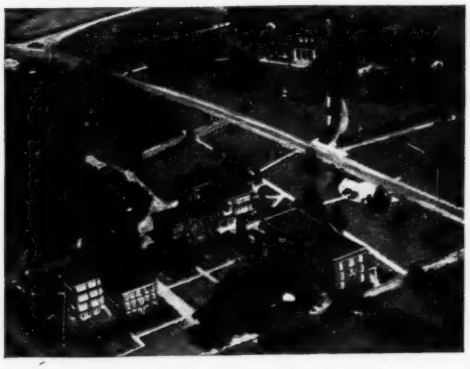

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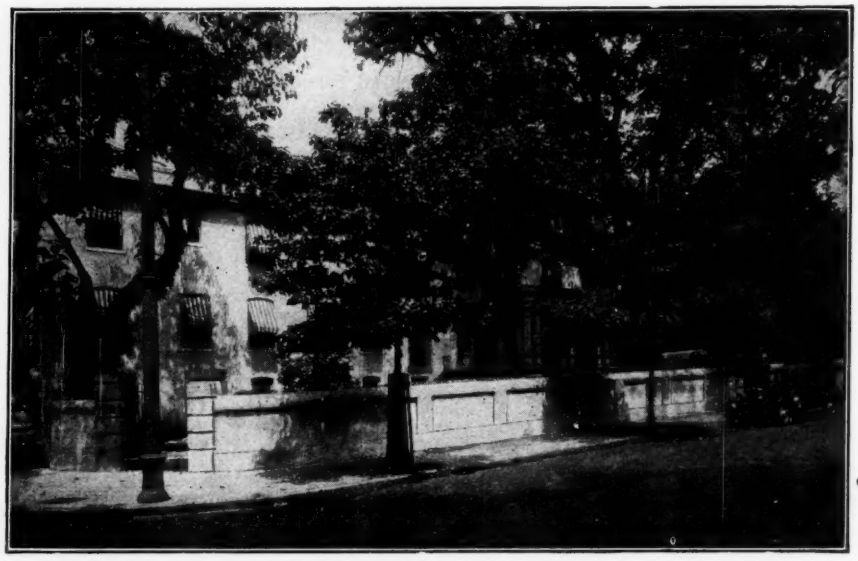

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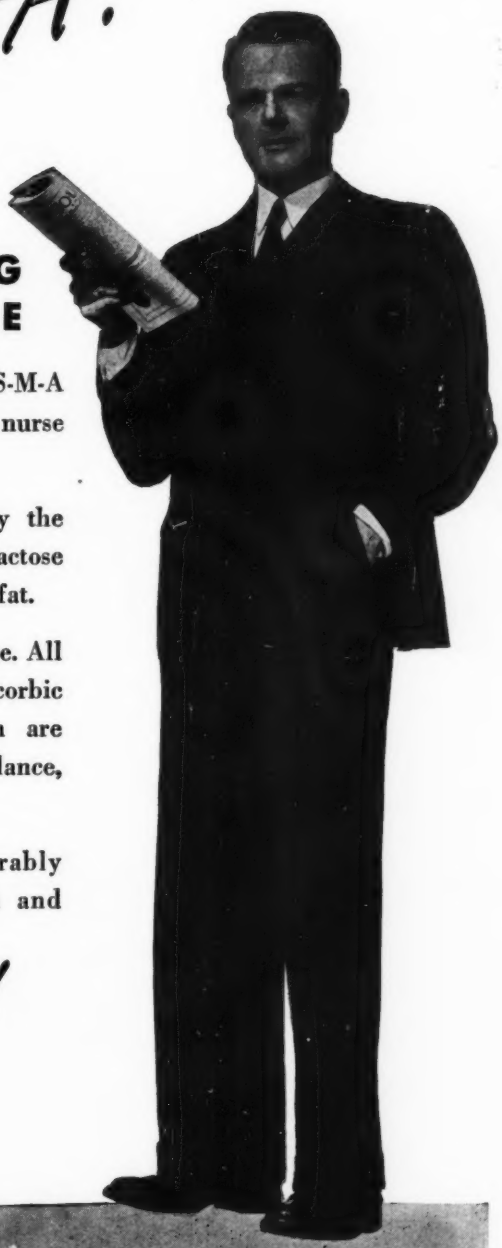

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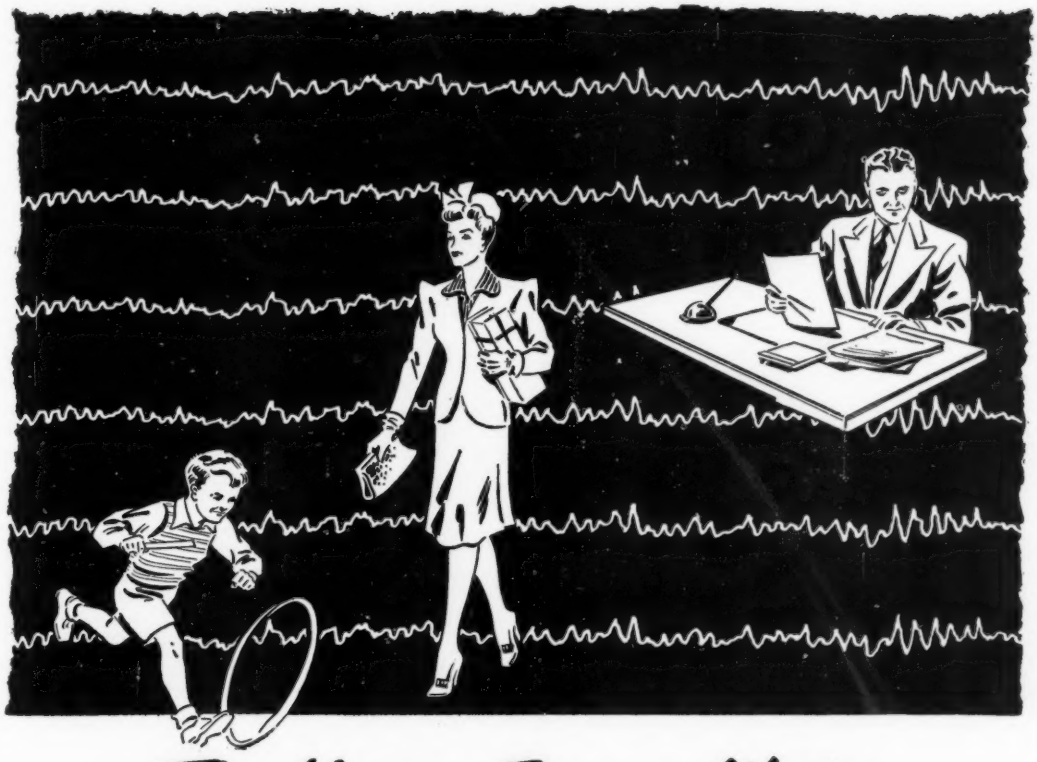

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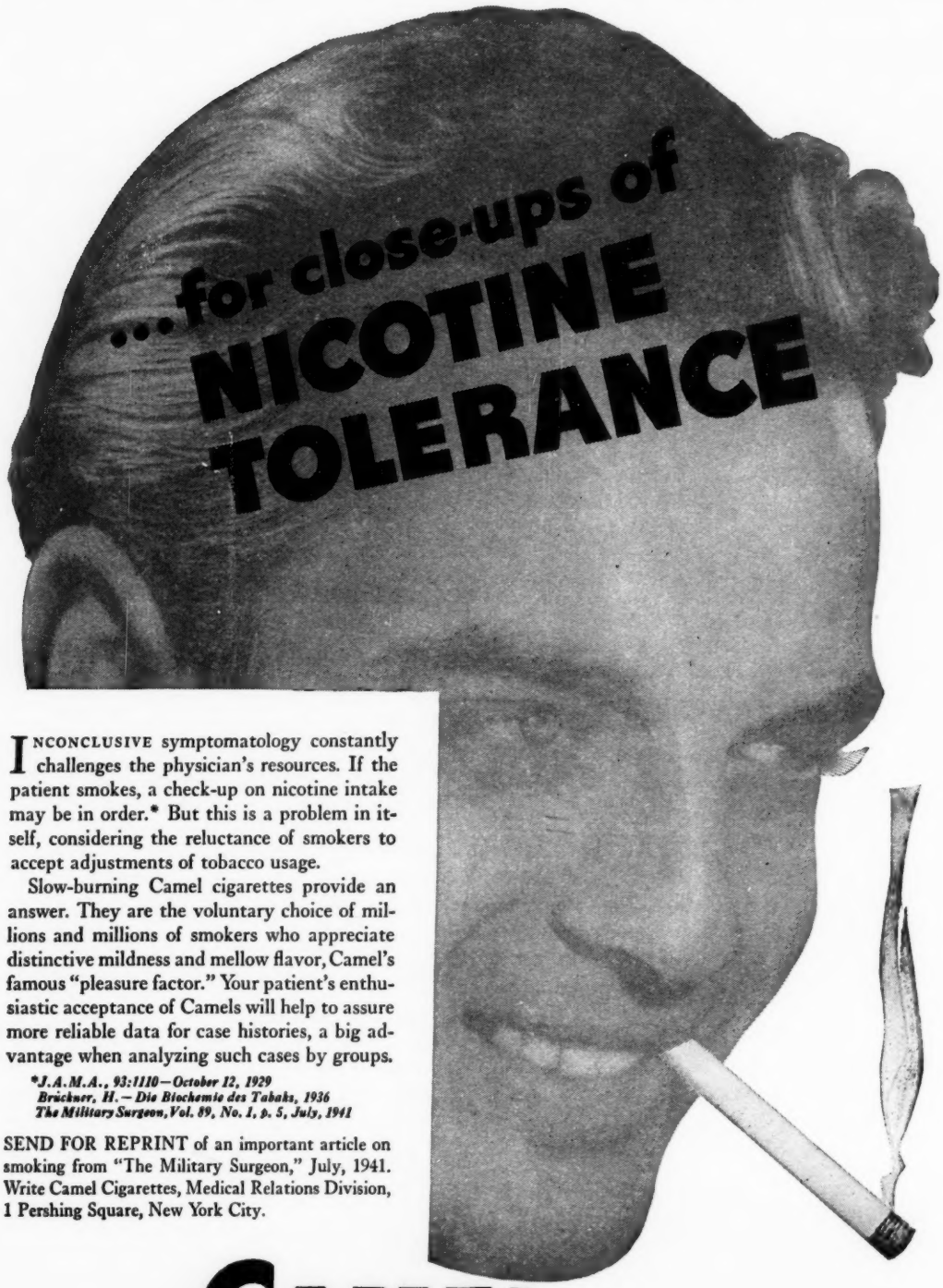

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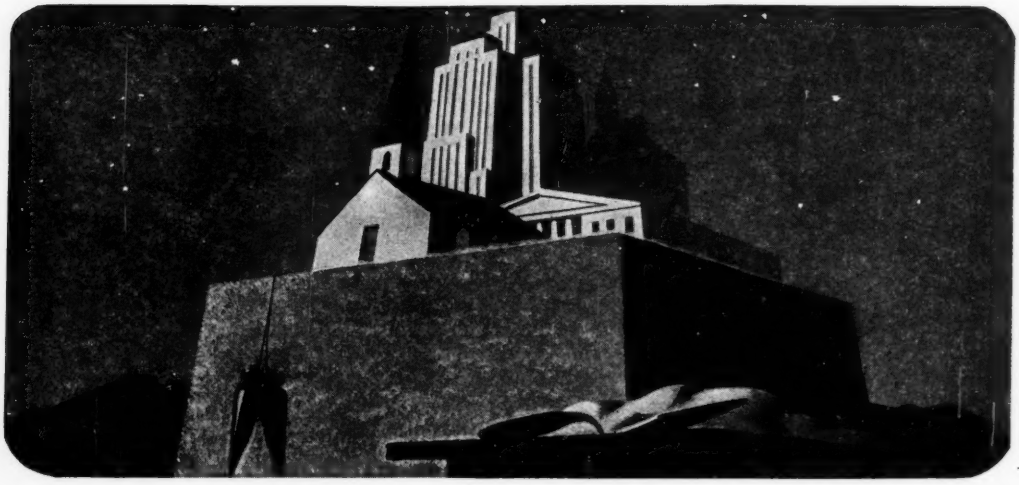

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SAFEGUARDS IN CATARACT SURGERY

FRANK E. BURCH, M. D.
AND
EDWARD P. BURCH, M. D.
ST. PAUL

The two most frequent complications of cataract surgery are loss of vitreous during operation and postoperative prolapse of iris. Naturally postoperative infection is the most dreaded of all complications. The reasons for loss of vitreous are several, including an apprehensive patient and a nervous operator, but incomplete anesthesia resulting in "squeezing" when the orbicularis is not paralyzed is perhaps the most frequent cause. Other primary and contributing causes are increased ocular tension, fluid vitreous and undue pressure during delivery of the lens because of a faulty incision, limited size of the palpebral fissure, too deep or too prominent an eye, or failure of the patient to look down. It should also be mentioned that occasionally too forceful irrigation of the anterior chamber, faulty technic of iridectomy and replacement of the pillars of the iris after the lens is delivered may cause the vitreous to present. Basically, one of the chief causes is imperfect akinesia and anesthesia.

The causes of postoperative prolapse of iris are even more numerous than the causes of prolapse of vitreous during operation. Sneezing, coughing, straining in defecation or urination, difficulty in mounting bed pan, faulty nursing or restlessness, gas pain and an uncomfortable dressing are all contributing factors, secondary perhaps to a "gaping wound." A frequent cause is postoperative hemorrhage; another is herniation of the iris into the wound because of insufficient communication between the posterior and anterior chambers. Also, one may mention failure to use cycloplegia in complete iridectomy, or miotics when a round pupil is preserved.

What safeguards may one take in order to prevent these two chief complications? The two main procedures which will obviate most of the complications are fairly modern improvements in cataract surgery, namely, better methods of anesthesia and akinesia, and the use of sutures. These valued changes in technic have come about gradually during the past twenty years and have proved helpful, and exceedingly desirable, in avoiding complications.

We have already mentioned the apprehensive patient. The administration of sedatives as an aid in preparation for operation under local anesthesia is desirable. Morphine, codeine and pantopan are not desirable because vomiting often follows their use. Sodium bromide, grains 30 by mouth, is excellent. The administration of 1½ grains of nembutal the night before and one hour before the patient goes to the operating room is exceedingly valuable. Sodium amytal in 2 or 3 grain doses administered the night before and one hour and a half, and one hour before operation in the morning usually does not produce such profound sleep as to interfere with cooperation. The barbiturates are not only valuable aids to anesthesia, but they also aid in lowering blood pressure. They allay apprehension without destroying consciousness. On a few occasions in exceedingly apprehensive patients pentothal sodium given intravenously has been employed for anesthesia. Evipan has not proved satisfactory. General anesthetics are rarely necessary, and they are a distinct disadvantage. One is never certain what the reaction may be. The use of sodium amytal, luminal, nembutal or seconal is sufficient for all ordinary purposes. These drugs are exceedingly helpful and have become, in fact, almost indispensable. We have not experienced more postoperative delirium following their use than in the old days when chloral and bromides were used.

Among the standardized local anesthetics, we prefer ½ per cent pontocaine. Cocaine has its disadvantages. It will not remain stable for long periods after boiling, although freshly boiled solutions of cocaine are perfectly satisfactory. A cocaine formula used for twenty years is a 4 per cent solution of cocaine in ½ per cent chloretone solution containing 1:4000 adrenalin. The chloretone is the preservative. These solutions are made fresh each week. There has never been occasion to believe that infection has followed use of this

From the Department of Ophthalmology, University of Minnesota.

Read before the Fourth Annual Meeting of the Florida Society of Ophthalmology and Otolaryngology, Hollywood, Apr. 12 and 13, 1942.

cocaine preparation, but cocaine has the disadvantage that it produces paralysis of lacrimation and desiccation of the cornea, with occasional detachment of epithelium during the act of expression, especially when cocaine has been used for too long a time before actual section and delivery of the lens and if the eye has not been kept occluded with a moist compress. In ordinary strength and in the quantity used for cataract surgery, there is no danger of toxic effect from cocaine. The old rule of instilling local anesthetics four times at intervals of four minutes will produce adequate anesthesia, providing the tension of the eye is not elevated and the eye is not congested. A tense eye or one with undue congestion does not absorb cocaine readily, and solutions of higher percentage are required. The moderate amount of dilation of the pupil produced by cocaine may be enhanced by adrenalin. Ordinarily it is good practice not to apply full strength adrenalin until after the last instillation of cocaine, about one minute before starting the operation.

Pontocaine possesses distinct advantages over cocaine, although an occasional patient is allergic to it. Pontocaine solution need not be boiled, does not desiccate the cornea, does not produce mydriasis and will not deteriorate with age. Anesthesia occurs quickly. Its effect is as durable as cocaine.

As a rule, local anesthesia should be begun when the surgeon and his assistant are scrubbing up, before the patient enters the operating room so that preparation of the field will be painless. The gloved assistant, or the operator himself, uses neutral green soap and water to cleanse the field of operation, irrigating with an abundance of boric acid solution, normal saline solution, or 1:8000 mercuric oxycyanide solution.

A small quantity if 1 per cent cocaine, to which a slight amount of adrenalin has been added, is injected over the insertion of the superior and the internal rectus muscles, or, if fixation of the eyeball is below, a small amount is injected over the insertion of the inferior rectus muscle. This method usually requires only a few drops aided by gentle massage through the lids. Less cocaine solution is required than if novocain solution is used.

For inserting a bridle suture to hold the eye downward, it is necessary to inject a few drops of cocaine over the central portion of the superior rectus muscle. Grasping the muscle at this point is always painful, and the ordinary instillations of cocaine or pontocaine are not sufficient to introduce painlessly the bridle suture, as it is ordinarily done, through the central portion only of the superior rectus tendon.

It is also desirable to inject 1 per cent cocaine solution just above the limbus when one does an occasional iridectomy preliminary to extraction of a cataract, in high myopes or for complicated nuclear cataracts. The cornea itself can be anesthetized easily, but the injection of a small amount of cocaine just above the limbus also renders the iris anesthetic. Incidentally, the preliminary iridectomy incision should always be made in the cornea just anterior to the limbus, and the injection above the limbus aids in anesthetizing the iris as well as the cornea.

The question is sometimes asked if injection of the superior rectus alone, without the bridle suture, will not produce sufficient paralysis so that the patient cannot look up, but one must remember the inferior oblique would also have to be completely paralyzed to be certain the patient will "look down" during an operation.

The next step is perfect akinesia or paralysis of the orbicularis and accessory muscles by injection of the superior branches of the seventh nerve. For this a 2 per cent solution of novocain (procaine) is used. Novocain may be boiled freely. It requires about 5 cc. of solution properly to anesthetize or paralyze the orbicularis. The novocain should be in a physiologic sodium chloride solution to which is added 1 drop of 1:1000 adrenalin or epinephrin hydrochloride. Injection should begin just outside the lateral canthal ligament at the orbital margin, with slow injection as a 24 gauge 6 cm. long needle is pushed forward along the upper lid to paralyze the orbicularis, the terminal fibers of the frontalis and the corrugator supercilii in turn. This slowly infiltrated injection produces akinesia of the temporal, malar, and infraorbital branches of the temporal facial division of the seventh nerve only.

It is important in injecting the upper lid to carry the injection well toward the inner angle of the orbit. The needle is withdrawn, and a similar injection is given to the lower lid as far as the region of the infraorbital foramen or notch. About 3 cm. of novocain fluid is used in injecting the upper lid and about 2 cm. for the lower lid.

As the needle is withdrawn, the point is turned, and a small amount is injected backward over the zygomatic region to be sure to catch any stray fibers of the nerve. Only twice in many hundred injections has striking a larger vessel at the upper inner orbital margin produced hemorrhage and ecchymosis. Quick pressure controlled the hemorrhage, and no harm resulted. In making these injections, one does not want to bog the lid unduly so as to interfere with subsequent control of the lid itself during operation. In passing the needle along the lid, if one follows the neighborhood of the margins of the orbit, one is certain to produce sufficient akinesia. It requires a little longer to produce paralysis of the muscle than it does to anesthetize the skin. One should wait until on test it is found that the patient actually cannot "squeeze." If the action of the frontalis and the corrugator supercilii is still too much in evidence and control of the lid is imperfect, it is better to give added injection over the vicinity of the supraorbital foramen or fissure. It sometimes requires as much as ten minutes for complete akinesia. One should not begin the operation until fully assured that it is impossible for the patient to "squeeze." One might mention that preliminary injection for producing akinesia is usually sufficient to do a canthotomy when this is necessary, and it frequently is.

O'Brien's method of producing akinesia is to locate the zygomatic arch with the index finger, push the finger down just anterior to the tragus of the ear to the point where the condyloid process of the mandible is palpable. At this point a 1½ cm. needle is passed down to the condyloid process to a point anterior to its center, and 1 or 2 cc. of 2 per cent novocain is injected. O'Brien emphasized the point that the needle must strike the anterior and not the posterior portion of the condyloid process to produce adequate akinesia. Our experience has shown that the Van Lint method, when the injection is given by assistants, is more generally successful in its results than the O'Brien method, and its only disadvantage is the occasional bog of the lids.

The third step in anesthesia which we wish to emphasize, and which we believe now has a definite and permanent place in cataract surgery, is the use of retrobulbar injection, or ciliary ganglion nerve block. These are not the same. In a true retrobulbar injection, 1 cc. of 2 per cent novocain is injected directly behind the eyeball, blocking the ciliary nerves to produce deep anesthesia of the eyeball. This deep anesthesia of the eyeball is a most desirable and valuable procedure, particularly applicable for cataract surgery, and has been employed by us for all cataract work during recent years. Previously we used it only for enucleation, for acute glaucoma and for retinal detachment. It has not been used for any of the juvenile types of cataract, but is as applicable for traumatic cataracts or cataracts in young adults as in senile cataracts. If the solution is improperly administered and the needle enters a muscle rather than within a muscle cone, it may produce only paralysis of the muscle involved without complete anesthesia of the eyeball. The method of administration is, therefore, important.

While some operators prefer a slightly curved needle (which can be easily made by heating the needle containing the brass wire and bending it to a ⅜ curve), a straight needle ordinarily serves the purpose quite as well. An ordinary hypodermic syringe and a 3 cm. 24 gauge needle are sufficient when one injects through the conjunctiva. If the injection is made through the lower lid so as to avoid contamination from the conjunctiva, a 5 cm. needle is required. After touching the skin with iodine, the injection is made behind the lower cul-de-sac between the inferior and lateral rectus muscles, while the patient looks upward and nasalward, with the point of the needle directed behind the globe toward the optic nerve. It is possible to injure the optic nerve, and one might fear a retrobulbar hemorrhage, but we have seen no evidence of injury of this nerve and have observed proptosis from orbital hemorrhage only once among hundreds of retrobulbar injections. It is desirable for all cataract surgery to have 1 drop of 1:1000 epinephrine solution added to each cubic centimeter of novocain solution. We know by repeated tests that intraocular tension is definitely lowered by retrobulbar anesthesia, providing adrenalin is included in the novocain solution. One is more fearful of insufficient anesthesia in resecting prolapsed iris than when operating for cataract. It is not necessary to inject a large quantity of novocain solution. The injection should be given slowly, beginning after the needle is well behind the capsule of Tenon; when so given it is difficult to conceive how any damage could be done. The addition of

the adrenalin solution distinctly lowers intraocular pressure, but rarely to a point of softness which will interfere with delivery of the lens.

The ciliary ganglion block is also a highly satisfactory method, but not so necessary for cataract work as it is for congestive glaucoma, for enucleation and for retinal detachment surgery. The ciliary ganglion occupies a position just inside of the lateral rectus muscle near the apex of the orbit. Its position is approximately 3½ cm. behind the cornea or 1½ cm. behind the globe. It is almost 4 cm. back of the lateral orbital margin. In giving this injection one should employ a 5 cm. needle and should begin the injection as soon as the point of the needle is along the inner side of the lateral rectus and on a level with the posterior surface of the globe. Although deeper injections as a rule are not employed in cataract work so frequently as those immediately behind the eyeball, when they are given, it is with the belief that there will be less proptosis or less pressure on the posterior surface of the eyeball, which might favor extrusion of vitreous. There is no actual proof of this one way or the other. As a matter of fact, experience leads one to conclude it is less possible to lose vitreous after retrobulbar or ciliary ganglion anesthesia is produced if ordinary gentleness and care are observed. In making retrobulbar injections, one should remember not to start the needle plunger until the needle is at least one centimeter behind the conjunctiva to avoid a ballooning of the conjunctiva and to make the injection slowly.

One might question whether it is necessary to use four instillations of cocaine or pontocaine if one uses retrobulbar anesthesia, but there are certain nerve branches given off from the supraorbital, infraorbital, lacrimal and other nerves around the orbit which go to the conjunctiva and cornea; anesthesia of the ciliary nerves does not completely anesthetize the conjunctiva itself. Retrobulbar anesthesia is particularly valuable also when prolapse of iris requires repair, especially if it is extensive. One must have complete anesthesia of the globe and be assured that the tension of the globe is below normal.

How soon after retrobulbar injection may one begin cataract surgery? Uusually after the retrobulbar injection and providing akinesia is satisfactory, the operation can be begun almost immediately. Another question which may be asked is, "Why give the injection through the lower lid," or, as Jameson and Greenwood advocated, "through the upper lid?" In giving the injection through the lower lid after the method suggested by Friedenwald several years ago, one avoids contamination from the conjunctiva. We have never met with infection following retrobulbar or ciliary ganglion injection. One cubic centimeter of 2 per cent novocain solution, properly placed, will usually suffice for a retrobulbar injection.

Different operators have different ways of anesthetizing the eye for cataract surgery. The methods described have been found adequate, satisfactory and harmless after rather generous experience. There is no excuse for a painful cataract operation. Imperfect anesthesia is the cause of more grief than any other single thing during the operation itself. Retrobulbar anesthesia is definitely advantageous in producing lower intraocular tension. We have come to fear the loss of vitreous less in any type of cataract operation, whether extracapsular or intracapsular, when retrobulbar injection is used. During the past several years with the routine described there have been fewer complications in cataract operations than ever before in our experience.

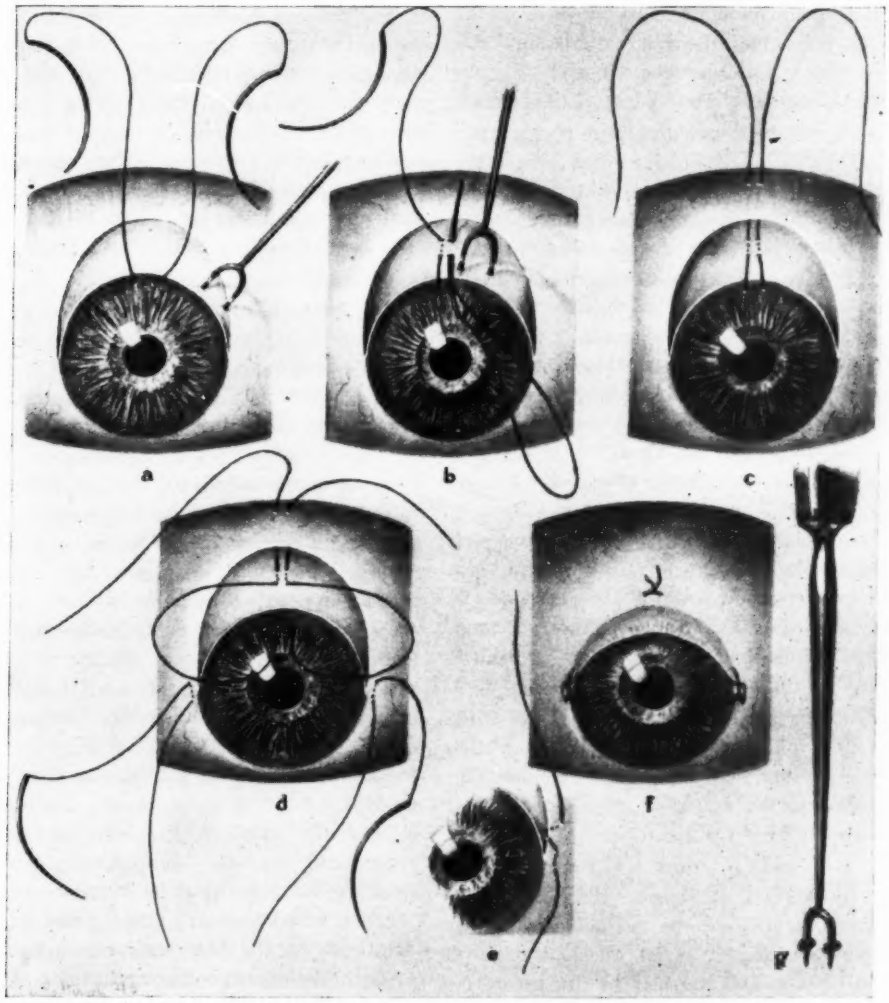
SUTURES

Good suture technic has been developed in the last decade, and suture materials and needles have been improved. Consequently few surgeons do not use them. The reason for sutures is both to prevent the loss of vitreous at the time of operation and to prevent subsequent postoperative prolapse of iris. Sutures not only lend security to the operation, but they also have the great advantage of permitting the patient greater freedom, less restriction and greater comfort, with an easier convalescence. They do away with the necessity of having patients lie perfectly still during convalescence with the head fixed or supported by sand bags and with the fears that something untoward is going to happen if the slightest movement is made. Most surgeons consider them indispensable for intracapsular operations; if they are indispensable for intracapsular extractions, the argument is just as good for classical standardized extracapsular operations. This is true whether a complete iridectomy or a buttonhole peripheral iridectomy is done. Sutures have come to stay. They are not required for preliminary iridectomy.

Much of the advantage of the suture is in the toilet of the wound. One can replace the iris or

its pillars, do small peripheral iridectomies if desired and irrigate the anterior chamber with the safety and assurance that one cannot have without some mechanical means of closing the wound. Prolapse of iris may occur notwithstanding a suture, but in the patient who sneezes, coughs, vomits, or gets out of bed, it is much less likely to occur if a firm suture has been placed. Why sutures are not universally used, or why eye surgeons have been slow in adopting this additional safeguard is difficult to understand. Probably the reason is that it has been considered difficult to introduce the needle through the corneal stroma, but this trick is easy with very little practice, good light, slight magnification and modern atraumatic needles, properly held in the needle forceps.

What type of sutures should be used? Do they ever become infected, since they are exposed externally with the conjunctiva? Do they produce any local irritation? Are they difficult to remove? How many sutures should be inserted? Should they be inserted after the section is completed, or before the section is begun? Shall surgeons limit themselves to conjunctival sutures, corneal sutures, corneoscleral sutures, or corneoconjunctival sutures? In answer one may say that they never become infected; they rarely



Corneoscleral suture with conjunctival apron for covering the section. Fixation "pic" enlarged 2x.

cause irritation if fine suture material is used, and they are not difficult to remove if one waits until healing is complete. Davis and Geck atraumatic No. 242 sutures are excellent for cataract work. Those who advocate the use of simple conjunctival sutures argue that corneal wounds heal quickly and simply need the slight traction and easy support of the conjunctiva to aid in the healing process. Some operators merely suture the conjunctiva as close as possible to the limbus after preparing a preliminary circumcision of the conjunctiva a few millimeters from the limbus, and place the sutures before making the section; others place the sutures after making the section. Those who advocate the Kalt corneal stitch, or the Boston corneoscleral suture or Verhoeff's modification of it prefer these methods in the belief that the tighter the wound the quicker the repair, the less the danger of complication and the greater the freedom of the patient.

There is a great variety of suture methods. The ideal suture is one which tightly secures the wound with perfect apposition, without overlap or distortion and at the same time permits covering the section with conjunctiva for protection against infection. Kalt's corneal suture was satisfactory in securing the wound, but Kalt's method was abandoned by us because it did not afford any conjunctival protective covering of the incision. A conjunctival suture method was proposed by Berens; another, the pocket flap method of Hussian, advocated by Lowell and modified by Spratt, involves dissection of a complete conjunctival flap which is turned down over the eyeball, the section of the globe being made beneath the conjunctival flap either with a Graefe knife or with keratome and scissors. We need not illustrate all methods. Choice of methods becomes a matter of individual experience and preference.

With the Van Lint method only the conjunctiva is circumcised from the upper two fifths of the globe and drawn down as a cowl or flap over the incision. It is a simple conjunctivoplasty, holding the wound in apposition without direct support by corneal sutures.

The corneoscleral suture was first advocated in 1854 by Williams of Boston. It has undergone various modifications. The method proposed by Blake of New Haven is an excellent one. It makes a tight wound and may be tied before the anterior chamber is irrigated or the pillars of the iris replaced. The method of taking a horizontal corneal suture with double-armed needles which are passed vertically through episcleral tissue and tied through the conjunctiva from beneath, then reinforced with supplementary Van Lint sutures laterally, completely covers the wound and answers all purposes. This secures a tight wound, and by the supplementary Van Lint lateral sutures one obtains complete coverage. The corneal suture should be placed about 1 mm. anterior to the limbus, through which the section is made. There is some difficulty in placing these sutures if the ordinary fixation forceps is used. For transfixing the eye the scleral fixation "pic" is admirable, and even preferable to fixation forceps. This "pic," made by Mueller and Company, is now on the market. After the corneoscleral sutures are placed and passed through the conjunctiva, they are looped aside for the incision; the ends are laid parallel over the patient's head and are quickly drawn up as soon as the lens is delivered, thus closing the wound and avoiding loss of vitreous. The method should be seen rather than described. For this purpose we have made a moving picture to illustrate the "pic" and the suture methods we employ.

A suture which was proposed by Lindner and slightly modified by McLean is an excellent method, the one objection to this technic being the danger of cutting out the suture when making the incision. To "hit" the preliminary incision, when cutting the last part of the section, especially with the Graefe knife, requires unusual skill, but by using the keratome and enlarging the wound with Aebli's scissors, one is fairly assured against cutting the suture placed across a preliminary cut in the limbus. Its advantage lies in the perfect apposition of the wound. Verhoeff's sutures inserted through preliminary needle tracks also assure one that the lips of the wound will be in exact apposition and that there can be no distortion of the cornea. In our experience Verhoeff's method is more difficult than the corneoscleral conjunctival or the Lindner method.

For all practical purposes, one can safely recommend the silk corneoscleral conjunctival suture method we have used uniformly, in conjunction with Van Lint's akinesia and retrobulbar anesthesia as the best assurance against either or both of the common complications of cataract surgery, loss of vitreous or prolapse of iris.

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THE MANAGEMENT OF SEVERE CRANIOCEREBRAL INJURIES WITH SPECIAL REFERENCE TO COMPOUND AND PENETRATING WOUNDS

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One way to classify craniocerebral injuries is to divide them into open and closed wounds. The latter are observed more frequently in civilian practice and are caused chiefly by automobile accidents and the head hitting blunt objects from falls. In cases of this type the injury of the brain, the subsequent edema and the increase in intracranial pressure, with possible intracranial hemorrhage, are the chief factors which one has to combat in the treatment. Infection in these closed wounds is not as a rule an important complicating factor.

In the present paper it is my purpose to discuss the open wound, the type which may become infected unless it is properly treated in the early stages. Since wounds of this kind are usually penetrating to involve the skull and dura, they are of serious and grave nature. The compound wounds of the vault are always associated with a laceration, or a break in the continuity of the scalp overlying the bone. Various types of instruments may be the offending agents causing these wounds. They may be caused by the pointed edge of a brickbat, hammer or hatchet, the projecting edge of a blunt object or a piece of machinery, a bolt, a doorknob, the edge of the curbing, a knife blade, or flying missiles such as a bullet, a gunshot, or flying metal as in shrapnel wounds. All but the last named are seen in civilian practice, while the shrapnel injuries are seen in warfare. They are also seen in air raids on civilians in wartime, when the exploding bomb causes fragments of metal of different sizes to fly through the air, striking and injuring persons. These pieces of metal may pierce the scalp, skull and brain, and cause severe damage to the tissues in their pathway. Since the shrapnel fragment has an irregular shape, it produces one of the most severe tearing and mangling types of wound of any of the flying missiles.

The tissues involved may be those of the scalp, skull, and brain, and all three may be involved at the same time. The wound is said to be penetrating when the foreign body enters the skull to involve the dura and brain. When the bullet or other foreign material enters and leaves the skull after passing through the cranial cavity, it is said to be perforating. In either the penetrating or perforating type the wound may be single or multiple. Occasionally a flying missile strikes the skull diagonally and ricochets from the skull so that the patient may have two scalp wounds, one of entrance and the other of exit. If the skull is exposed in this type of wound, the outer table may appear to be only slightly damaged. On further investigation, however, one may find a severe comminution with depression of the inner table of the skull and adjacent contusion or even laceration of the dura and brain. This is a gutter type of wound which may be caused by a bullet striking the skull tangentially.

Since these are compound wounds, they requite a surgical procedure to carry out the proper treatment and to prevent infection. The best time to do the operation is as early as possible after the receipt of the wound, but this depends upon the condition of the patient when he is first examined. Sometimes he is in shock, and the operation should be postponed. Some of the signs of shock may be a lowered blood pressure, a fast, weak, irregular pulse, irregular sighing respiration, pallor and coldness of the skin, and suppression of the mental faculties. If these symptoms are present, it is urgent that the patient be treated by the usual measures for overcoming surgical shock. As a rule the patient will respond within the first six hours after proper treatment. If he does not respond, he probably has a severe injury of the vital centers, and operative treatment would be of no avail. At times the patient responds slowly, and often it seems wise to postpone the operation for twenty-four hours after the injury. While it is best to perform it sometime during the first twelve or sixteen hours, satisfactory results have been obtained in selected cases by waiting twenty-four hours. The greatest danger of delaying the operation is the risk of infection. On the other hand, the delay is favorable in that it makes the operation and the control of fresh bleeding much easier by allowing the clot to form and firmly plug the bleeding vessel. The objection to the early operation in some of the severe penetrating and perforating wounds of the brain is dislodging the clot and stirring up a severe deep-seated hemorrhage, which is difficult to control. By delaying the

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operation twenty-four hours there is less danger of causing a fresh severe hemorrhage if one is gentle in his manipulation and treatment.

The operation may be delayed if the patient appears to have a rapidly fatal type of injury from the beginning. In this type of injury he is in deep coma and cannot be aroused on stimulation; the respirations are irregular in rhythm, deep and stertorous, while the blood pressure is normal or even high. It is best to watch this patient for a while and treat him conservatively even though he may have a deep-seated intracranial hemorrhage, which he likely has if there is a perforating wound of the skull and brain. The chances of controlling it and repairing the damage by an early operation are usually slim and the prognosis hopeless. If the patient overcomes the initial shock and compression by delay and conservative management, the operation can just as well be performed at some later date, preferably during the first twenty-four hours.

At operation the first step is the proper treatment of the lacerated wound of the scalp. It is important that all lacerations of the scalp be treated in a manner here described. An infection of the scalp following inadequate primary treatment may result in a serious complication, such as osteomyelitis of the skull, meningitis, or even abscess of the brain. In all cases of scalp wounds the hair should be clipped short and the scalp shaved over a wide area around the laceration. The scalp is painted around the edge of the fresh wound with a suitable standard antiseptic solution. A 1 per cent solution of novocain with 2 drops of adrenalin to the ounce is then injected into the scalp around the laceration so as to encircle it. By this means the wound is made completely insensitive. Then it may be washed thoroughly with sterile soap and water, and irrigated with a large quantity of normal salt solution to clean it of all foreign material. It is further debrided by excision of the ragged torn edges of the laceration with a sharp knife and by making an incision well into normal healthy tissue. When debridement is completed, the instruments which were used in making the incision are discarded, and hemostats are applied to the galea, or skin clips may be used to control the hemorrhage from the scalp.

The bone is uncovered, and one has to deal with the depressed fragments which are usually comminuted and driven into the cranial cavity. It is not unusual to find hair, pieces of clothing, or other foreign material imbedded with the bone fragments through the torn dura into the brain. Sometimes it is possible to bite away some of the bone with rongeurs to free the depressed fragments. It is, however, most frequently necessary to drill a hole and enlarge it with bone-biting forceps in order to insert an elevator and raise or remove the depressed fragments in order to make a proper examination of the underlying dura and brain. It is also necessary to make a thorough exploration of the inner table of the skull for a distance around the margin of the wound. There may be more fragments of bone with depression from the inner table than are evident from inspection of the external surface. Unless one has a fairly large opening, it will not be possible to remove these remote depressed fragments of bone. The fragments of bone which have been removed may be preserved and kept in a sterile container, since they can be put back in the cranial defect in a mosaic pattern to act as a bone graft for repair of the defect. Before the days of chemotherapy the surgeon never put these loose fragments of bone back in compound injuries of this type because of the danger of infection. He always, however, replaced fragments of bone attached to soft tissue in compound wounds and reinserted loose fragments of bone in the simple depressed fractures with good results. Now even though the wound is contaminated, the loose fragments of bone may be reinserted and a large quantity of sulfanilamide powder packed about them when the wound is closed. It is advisable that the patient be given one of the sulfanilamide group of drugs by mouth until the danger of infection is over. A prophylactic dose of tetanus antitoxin should be given during the first twenty-four hours.

The most important consideration in the treatment of compound wounds of this nature is the proper care of the laceration of the dura and the underlying injury of the brain. One or more fragments of bone or indriven foreign body may have lacerated the dura and brain. This injury may be manifested when the wound is first treated by pulpified brain tissue extruding through the laceration of the scalp. The opening in the dura may have to be enlarged so as to get adequate exposure of the injured portion of the brain. The wound in the brain is thoroughly irrigated with Ringer's solution, which washes away loose, devitalized pieces of brain tissue together with clots or other foreign material deposited in the wound.

Two of the greatest additions to neurologic surgery in the past fifteen years have been the use of suction and electrosurgery. By means of suction it is possible to remove nearly all of the devitalized soft tissue, blood clots and other foreign material so that one can see into the depth of the wound and repair the damage as far as possible. Likewise, all bleeding points can be picked up easily and coagulated with the electrosurgical unit, or an artery of good size can be controlled by means of a silver clip. By a thorough debridement of the wound removing nonviable tissue and blood clots, it is possible to minimize the formation of a cicatrix in the brain and thereby lessen the danger of convulsions. It is important to close the dura tightly, preferably using interrupted silk sutures. One should never pack the brain with gauze, and practically never is it necessary to use a soft rubber tissue drain inside the dura. The wound may be thoroughly packed with sulfanilamide powder, which is used extradurally. The scalp wound should be sutured in two layers of interrupted silk, one for the galea and the other for the skin. As stated before, no drainage should be used except in rare instances, and then extradurally.

In wounds of penetrating and perforating types caused by bullets and other flying missiles the same principles of treatment with slight modification should be used. The scalp wound of entrance is usually small, round and more or less like a puncture wound. There may or may not be a wound of exit. If one is not found, it may be assumed that the bullet or other causative foreign agent is somewhere imbedded in the cranial cavity. It is necessary in most cases that the patient be examined roentgenologically before operative treatment is undertaken, so as to determine the direction and the location of the foreign body. In case it has lodged in some accessible place, it is important that its accurate localization be marked off on the scalp under the fluoroscope, which will facilitate its removal.

The surgical treatment of these wounds consists of thorough debridement of the wound of entrance as previously described. The skull opening may be slightly enlarged by removing the edge of bone. There are usually indriven fragments of bone carried into the brain substance for one, two, or three inches. The principles of treatment of penetrating wounds of the skull and brain as laid down by Cushing during the first World War hold good today. By means of a soft rubber catheter passed into the tract of the bullet, through which is irrigated Ringer's solution, it is possible to remove loose, pulpified brain tissue, blood clots, pieces of bone and frequently fragments of bullet lying in the pathway. Occasionally it is possible to remove the main fragment of bullet should it not be too deeply situated. It is possible to feel the bullet and fragment of bone against the end of the catheter, and the palpation of a gloved little finger in the tract of the bullet may facilitate the removal of this foreign material. After removal of the debris and thorough cleansing of the brain wound the dura should be closed tightly. Should the dura have lost in substance, it may be repaired by using a graft of fascia taken from the neighborhood of the wound or from the fascia lata. The scalp wound is closed firmly as previously described without drainage. It should be mentioned here that drainage beneath the dura should never be allowed.

If the bullet wound has perforated and gone entirely through the skull and brain to the opposite side, the wound of exit should be debrided and handled in a similar manner to that of the wound of entrance. Should the bullet be lodged in the cranial cavity at some accessible place near the surface, one may remove it by making an opening over the point nearest the bullet. This should previously have been determined by localization under the fluoroscope and by making suitable marks on the scalp. By means of a small incision of the scalp under local anesthesia over the determined location of the bullet, a button of bone about 1 inch in diameter is removed with a trephine and the button of bone saved so that it may be later reinserted into the wound. The dura is then opened by means of a crucial incision or by a small flap. One can now usually see the contusion or laceration of the cortex at this point where the bullet is located. By inserting a small needle one can feel and locate the bullet and remove it with little damage. The dura is then closed, the button of bone replaced and the scalp wound repaired in the manner previously described. In some cases it has been deemed advisable to turn down a small bone flap overlying the bullet so as to give a wider field of exposure encircling the bullet.

It is not always advisable nor necessary to remove the bullet or metallic foreign body deeply lodged in brain tissue. Removal will depend largely on the location of the bullet and whether

it would cause more damage to the brain to remove it than to leave it alone. It is said that the objection to leaving a bullet in the brain is the danger of convulsions. This theory may be refuted since it has been shown by Ascroft[1] from experience with wounds of the brain in the first World War that when the bullet or shrapnel was removed from the brain, there was a slightly higher incidence of convulsions than when it was left in place. This greater frequency would seem to bear out the fact that the act of removing the bullet may cause damage and a more irritating scar than if it were left undisturbed. On the whole it might be stated that if the bullet involves the cortex, especially near the motor area and close to the fissure of Rolando, it should be removed, as the incidence of convulsions is much greater when this important structure is involved.

It is important to mention the possibility of convulsions in connection with depressed fracture of the skull. In all depressed fractures no doubt the greatest damage has been done at the time the injury was received. It is believed by one school that all depressed fractures of the skull should be elevated since the continued depression may further damage the brain and thereby predispose to convulsions. There is another school, however, which claims that further damage is not caused by this slight depression of bone. This hypothesis is partly substantiated by the experimental work of Naffziger and Glaser,[2] who showed in animal experimentation that indentation of the skull or the insertion of a foreign material between the skull and the dura over a long period of time causes no structural change in the underlying cortex of the brain. Wagstaffe[3] reported that in the cases included in his series the incidence of convulsions in depressed fracture of the skull with intact dura was 1.6 per cent, while with laceration or penetration of the dura it was 18.7 per cent. In most depressed fractures of the skull, even though the outer table appears to be only slightly depressed, one usually finds the inner table comminuted and the loose fragments may be on the edge or even cause a penetration of the dura. Should the dura be penetrated and the brain cortex severely contused, pulpified or lacerated, it is important that a suitable repair be made to these structures. It stands to reason that if depressed fractures are repaired, the devitalized and pulpified brain tissue removed, the blood clots sucked away and the dura sutured, there will be less danger of an adherent fibrous scar and less danger of convulsions. Consequently it is believed that all depressed fractures of the skull should be explored and elevated, especially when they overlie important parts of the brain cortex and functional centers.

A word may be given in regard to the edema of the brain and the increased intracranial pressure which may follow any severe trauma of this organ. The usual dehydrating measures are used as indicated, and one of the principle means in this line is the proper limitation of the intake of fluid. The patient is rarely allowed over 1,500 cc. of fluids in the first twenty-four hours. It is seldom that a hypertonic solution of glucose or sucrose has to be administered, but in case one is used, it is usually the latter. It is customary to give 100 cc. of a 50 per cent solution of sucrose at a dose. Magnesium sulfate, given by mouth or by rectum, may be used for this purpose.

As a sedative paraldehyde, administered either by rectum or by mouth, is preferable, but one of the barbital group of drugs may be used. One should not use morphine or an opiate unless the milder sedatives have failed to quiet the patient.

Spinal puncture should not be used in the treatment of open and compound wounds of the brain because of the danger of spreading the infection. When there are frank signs of a diffuse subarachnoid infection, it may be done for the purpose of making a diagnosis.

REPORT OF CASES

Case 1.—D. P., a white man aged 35, was admitted to Riverside Hospital on Oct. 4, 1941, with a compound depressed fracture on the left side of the frontal bone through the sinus. The internal plate of the left frontal sinus was pushed back ¾ inch. Generalized convulsions occurred after the patient was admitted. The operation, two hours after admission, consisted of debridement, removal of a loose piece of bone and elevation of the attached fragments. The wound was packed with sulfanilamide powder, and the sinus was packed. The packing was removed in five days. The wound healed by primary union. The patient made a good recovery and was discharged on October 25. He went back to work in three months. There were no residuals.

Case 2.—C. P. W., a white man aged 58, was admitted to St. Luke's Hospital on March 10, 1940, after having been hit on the head with a hammer five or six times at 11 p. m. on the day of admission. He was dazed and had weakness of the right leg since that time. Roentgen examination showed a comminuted depressed fracture of the skull in the parietal region on the left side. A diagnosis of compound depressed fracture of the skull in this region was made. At operation, three hours after the initial injury, under local anesthesia the laceration of the scalp was debrided over the depressed fracture of the skull ½ inch in depth. By making a drill hole beside the depressed area the fragments of bone were elevated and removed. The dura was intact. The wound was closed with silk. Following the operation the wounds healed primarily. The paralysis of the right leg im-

improved, and the patient was discharged on April 7, four weeks after the operation.

Case 3.—P.G.S., a white man aged 20, was admitted to St. Luke's Hospital on July 13, 1938. He had been in a motorcycle-automobile accident, in which he was rendered unconscious and received a laceration in the parietal region of the head on the right side. He was seen four days after the injury when he was conscious and showed no objective neurologic signs. Roentgen studies of the skull made two days after admission revealed a depressed fracture of the skull over an area 2 inches in diameter in the parietal region. The depression was ¾ to 1 inch in diameter. After ten days had elapsed with no signs of infection, the operation was performed. The ragged laceration which was partly healed was excised. The depressed fragments of bone were elevated and removed. Some depressed fragments which were attached to soft tissue were elevated and left in place. The dura was found intact. The wound was closed with catgut and silk, and it healed by primary intention. The patient made an uneventful recovery and was discharged on August 7, twenty-five days after admission.

Case 4.—J.M., a negro man aged 51, was admitted to the Duval County Hospital on August 31, 1936, with a history of having been struck on the right side of the head by a broom handle. He was unconscious. Roentgen examination of the skull showed a stellate fracture in the parietal region on the right side with a depression of 1 inch over an area 1½ inches in diameter. The operation, twenty-one hours after the initial injury, consisted of debridement of the laceration of the scalp, removal of depressed fragments of bone, repair of tears in the dura and removal of devitalized pieces of brain tissue. The wound was closed with silk. The patient made an uneventful recovery and was discharged from the hospital on October 4, approximately one month after the injury.

Case 5.—J.T., a white girl aged 13, was brought to St. Luke's Hospital on May 1, 1939, following injury received when she was struck by an automobile. She was seen in the emergency room soon afterward and appeared conscious, but she was dazed. There was weakness of the right side of the face and of the right arm. A long curved laceration of the scalp extended from the frontal to the occipital region on the left. In the parietal region on that side over an area 3 inches in diameter was a depressed fracture of the skull. In the temporal region on the same side was another 3 inch laceration with a comminuted depressed fracture of the skull and laceration of the dura and brain. The blood pressure was 110 systolic and 70 diastolic. The patient was taken to the operating room immediately, and under local anesthetic the lacerations of the scalp were debrided, the loose fragments of depressed bone were removed, and some which were attached were elevated. Loose fragments of brain tissue were washed away, and the dura was repaired. The scalp wound was closed with silk. Her progress after the operation was uneventful. The wounds healed by primary union. She had temporary aphasia and weakness of the right side, but they had cleared up and she was walking when discharged on June 4, approximately one month after the operation. A roentgen study of the skull was made three weeks after the operation which showed the cranial defect 3½ by 5 cm. in the temporal region on the left side with a fragment of bone 2½ cm. square in the center of the defect, which was in good condition.

Case 6.—J.L., a white man aged 29, was admitted to St. Vincent's Hospital on Aug. 13, 1939, after his head had been struck in an automobile accident while he was asleep with his head lying on his right arm partly out of the window when his car was side swiped by another. He was unconscious for a short time. Examination revealed a laceration of the frontal region on the right side. There was slight weakness of the lower portion of the face on the left side; weakness of the left arm was also noticed. The tendon jerks were active on the left side. Roentgen examination demonstrated a comminuted depressed fracture of the skull involving the entire frontal bone on the right side. At operation the entire frontal half of the skull on the right side was found to be depressed, and the dura and frontal lobe were lacerated. Elevation of the bone and repair of the dura were carried out; the many pieces of bone were replaced in a mosaic pattern. The scalp wound was closed with silk. The patient was making an excellent recovery and was discharged three weeks later on September 5. He was readmitted on September 8 and discharged again on October 6 after having had pneumococcic meningitis. Cure was effected by sulfapyradine therapy and spinal drainage. He has since had several convulsions.

Case 7.—W.B., a white boy aged 13 months, was brought to St. Vincent's Hospital on Jan. 18, 1940, with a history of having been struck by a train while playing on railroad tracks. He had received a compound comminuted depressed fracture of the skull in the frontal and parietal regions on the right side. The scalp wounds had been closed with skin clips by the home physician. The patient was unconscious and in shock when examined. The operation, performed twenty-four hours after the accident, consisted of debridement of the scalp wound, elevation and removal of depressed fragments of bone with removal of coal dirt and other foreign material, and cleansing and repair of the lacerated dura and brain. The wound became infected, and osteomyelitis of the skull developed. On February 24 an operation was performed for removal of sequestra and drainage of an extradural abscess. On March 5 an abscess of the right frontal lobe was drained. There developed a brain fungus in the frontal region on the right side and the patient expired on May 20. It would have been better if this patient could have been operated on during the first few hours after the injury.

Case 8.—J.P.S., a white man aged 22, was admitted to St. Vincent's Hospital on Jan. 19, 1937. He had been injured when the lid from a dump truck fell and struck him in the temporal region on the left side of the head rendering him unconscious and causing a compound, comminuted depressed fracture of the skull in this region with laceration of the dura and brain. Examination showed that the patient was semiconscious and appeared aphasic. Roentgen studies of the skull showed a severe comminuted depressed fracture of the skull in the temporal region on the left side about ½ inch in depth. The operation, performed about four hours after the injury, consisted of debridement of the wound, elevation and removal of loose fragments of bone, repair of the laceration of the dura and removal of devitalized loose fragments of brain and blood clots. The wound was closed with silk and healed by primary union without infection. The patient had a rather stormy time with increased intracranial pressure and edema of the brain, but this condition was kept under control by dehydration and spinal puncture. He was discharged from the hospital showing great improvement on February 11, three weeks after the operation. He returned to work, but has had several convulsive seizures since then.

Case 9.—G. G., a white man aged 33, was admitted to St. Vincent's Hospital on Oct. 20, 1936. He had been injured two and one-half months previously while pumping an automobie tire which blew out, causing the rim to strike his head, thereby producing a compound depressed fracture of the skull in the frontal region on the right side which rendered him unconscious. The wound had been draining since the injury. The patient felt well otherwise, and neurologic examination gave essentially negative results. Roentgenograms of the skuli showed depressed fractures of almost the entire frontal bone with overlapping of the edges and a depression of ½ inch or more. At the upper part there was erosion of bone sug-

gesting osteomyelitis. A diagnosis of osteomyelitis of the skull and an old comminuted depressed fracture of the frontal bone on the right side was made. At operation on October 21 sequestra and depressed fragments of bone were removed. The dura looked intact and healthy. The blood Kahn test gave positive results and the patient was put on specific treatment. On discharge from the hospital on November 9, three weeks after the operation, he was making a good recovery, and the wound was almost completely healed. This complication probably could have been prevented by debridement during the first few hours after the injury.

Case 10.—G. C., a negro man aged 34, entered the Duval County Hospital on Nov. 15, 1939. He had been stabbed in the head, and the knife blade had broken off in the skull. Examination revealed a broken knife blade protruding from the scalp at the vertex. A roentgenogram of the skull showed a knife blade 1½ inches in length broken off and penetrating the skull with a recent depressed fracture of the skull. There was also an old depressed fracture posteriorly and mesially. At operation twenty-four hours after the injury the wound was debrided, and a drill hole was made beside the knife blade wound. The bone was nipped away with rongeurs so as to dislodge the knife blade and to remove it. It had penetrated the dura and brain substance. The dura was repaired, and depressed fragments of bone were removed. The wounds healed without infection. There developed no paralysis nor neurologic disturbance. The patient was discharged from the hospital on November 28, twelve days after the operation.

Case 11.—J. DeW., a white boy aged 8, was admitted to St. Luke's Hospital on July 25, 1936, following an automobile accident in which he received a laceration of the scalp behind and above the left ear. He was unconscious and remained so for several days. He had pyramidal tract signs on the right side. Roentgen examination of the skull showed a depressed fracture area in the posterior temporal region on the left side with a retained metallic foreign body. There was also a fracture of the left femur. The patient was operated on four hours after admission. The laceration in the temporal region on the left side was debrided, and a metallic foreign body 2 inches long from a door handle was removed. It was lying on a depressed comminuted fracture of the skull. The depressed fragments of bone were removed leaving a cranial defect 2 cm. in diameter. The dura was intact. The wound was closed with silk. The patient remained unconscious and showed increasing signs of intracranial pressure with paralysis developing on the left side. On the sixth day after admission an exploratory operation and decompression were done in the temporal region on the right side revealing bloody fluid and some clots, which were removed. Following this operation the patient gradually improved by the use of dehydration and spinal punctures. The operative wounds healed primarily. He was discharged from the hospital on September 12, about seven weeks after admission, having made a satisfactory recovery.

Case 12.—T.M., a white man aged 36, entered St. Vincent's Hospital on April 18, 1940, with a self-inflicted bullet wound of the right side of the head. There were two small round wounds in the parietal region on this side 1½ inches apart. The patient was either unconscious or appeared aphasic. Rigidity and weakness of both arms and legs were noted. Roentgenograms of the skull showed in the parietal region on the right side an irregular opening in the skull 1 cm. in diameter with a bullet lying in the parietal region on the left side about ¾ inch from the inner table of the skull. There were bullet fragments and pieces of bone in the bullet tract near the wound of entrance. The operation, performed four hours after admission, included debridement of the wound of entrance, removal of fragments of bone, irrigation of the tract of the bullet removing pulpified brain tissue and blood clots, and plastic repair of the dura. The wound was closed tightly with silk. A trephined button of bone was removed from the parietal area on the left side, and the bullet was removed from beneath the cortex. The button of bone was replaced, and the wound was closed. The wounds healed primarily. Neurologically the patient showed only slight improvement in the quadriplegia. He was discharged from the hospital six weeks after the operation.

Case 13.—B.P., a negro woman aged 44, was admitted to the Duval County Hospital on November 26, 1937, after receiving a bullet wound on the right side of the head with the bullet lodging on the left side. She was conscious on admission and there was hemiplegia on the right side. Roentgenograms showed the wound of entrance in the skull in the parietotemporal region on the right side and the bullet lying on the left side in the occipitoparietal region. The operation, twelve hours after the injury, consisted of debridement of the original wound of entrance on the right side and washing out the tract of the bullet. A small button of bone was removed from the parietooccipital region on the left side, and an effort was made to locate the bullet with a needle without results. The wound was closed without locating the bullet. The patient expired on November 28, two days after admission.

Case 14.—D.S., a negro woman aged 30, was brought to the Duval County Hospital on Dec. 2, 1938, after she had received a pistol bullet wound of entrance in the parietal region on the left side, the bullet lodging anteriorly near the midline beneath the frontal bone. The operation was performed fourteen hours after the initial injury. The wound of entrance was debrided, loose fragments of bone and pieces of bullet were removed, and loose fragments of brain tissue and blood clots from the tract of the bullet were washed away. Plastic closure was made of the wound. The main fragment of the bullet, lying in the frontal region on the right side, was removed by making a small bone flap and opening the dura in this region. The bullet was found and removed just beneath the cortex. The wounds healed without infection. The patient was discharged from the hospital on Jan. 3, 1939, about five weeks after the date of admission.

Case 15—R.B., a white boy aged 16, was admitted to Riverside Hospital on March 3, 1938. On the preceding evening he had been shot by a small caliber bullet in the parietal region on the left side. There was no wound of exit. He was paralyzed on the right side and was aphasic, but not completely unconscious at any time. The operation, performed at 2:30 p.m. on the day of admission consisted of debridement of the wound of entrance, removal of a fragment of bone and pulpified brain tissue with blood clots from the wound, and removal of one large fragment of bullet and several smaller ones. The wound was closed with silk and healed primarily with no infection. The paralysis and aphasia were improving when the patient was discharged on March 13.

Case 16.—E.A.S., a white man aged 32, entered St. Vincent's Hospital on Dec. 3, 1939. On November 9, or about a month previously, he had been shot in the right temple, losing the sight of the right eye. He was able to walk at first, but two weeks later became weak in all extremities, more especially the legs. Roentgenograms of the skull taken following his admission to the hospital showed a bullet wound of entrance in the temporal region on the right side just lateral to the right orbit and the main fragment of bullet lying on the right side near the falx about 3½ inches back of the internal plate of the frontal bone. Several small metallic fragments and bony fragments were seen near the tract of the bullet. The operation on December 7 consisted of trephination over the frontal region on the right side and removal of the bullet near the surface. The bullet was easily found after making a short incision in the cortex where pulpified brain tissue was found in the tract of the bullet. The button of bone was

replaced, and the wound was closed. The wound healed, and the patient was making a good recovery when he was discharged from the hospital on December 24, two and a half weeks after the operation.

Case 17.—C.K., a white man aged 21, was admitted to St. Luke's Hospital on June 16, 1937, with a history of having been shot accidentally with a 22 caliber rifle. He was unconscious. Examination showed a wound of entrance of the bullet in the frontotemporal region on the left side and paralysis on the right side. A roentgenogram of the skull showed the wound of entrance in the skull in the frontotemporal region on the left side passing backward to the occipitoparietal region on the right side. Fragments of bullet dust and bone were seen in the tract of the bullet. The bullet was localized under the fluoroscope. At operation, eight hours after the patient was admitted, the wound of entrance was debrided, loose fragments of bone were removed and by irrigation of the tract of the bullet through a catheter loose fragments of brain tissue and bone, and fragments of the bullet and blood clot were removed. The wound was closed with silk. Then an incision was made over the temporoparietal area on the right side, and a button of bone was removed with a trephine. The dura was nicked where it had been struck by the bullet. Pulpified brain tissue and blood clots were washed away. The lead mass of a 22 caliber bullet was found and removed. The dura was repaired, the button of bone was replaced, and the scalp wound was closed with silk. The patient remained unconscious. Paralysis developed on the right side, and there was evidence of massive brain damage. He died on June 26, ten days after the initial injury.

Case 18.—C.E.W., a white man aged 20, was seen in consultation with Dr. J. R. Chappell on Oct. 10, 1941, at the Orange General Hospital, Orlando. He had received a bullet wound of entrance in the parietooccipital region on the left side which rendered him unconscious immediately and he had remained so ever since. The examination showed that the patient was unconscious, but could be aroused slightly and was apparently aphasic. He was said to have had weakness in the right arm and leg. Roentgenograms of the skull showed the wound of entrance in the parietooccipital region on the left side with many indriven bone fragments and bullet dust in the tract, with the main fragment of the bullet lying in the frontal region on the right side. The operation was performed about seven hours after the initial injury under local anesthetic and consisted of debridement of the scalp wound of entrance, enlargement of the bony opening and removal of bone fragments, loose devitalized brain tissue and blood clots in the tract of bullet, by means of irrigation of normal salt solution through a rubber catheter. A plastic closure of the wound was then left undisturbed as it would require another operation to remove it, and this did not appear urgent at the time. The patient made satisfactory progress following the operation, according to reports from Dr. Chappell, and recovered sufficiently to be discharged from the hospital sixteen days after the operation. From last reports about two months postoperatively he was walking, had weakness of the right arm and was aphasic. He will no doubt continue to improve, but it is too early to state how nearly complete recovery will be.

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DISCUSSION

DR. W. DUNCAN OWENS, Miami Beach: I wish to compliment Dr. Lyerly upon his interesting and timely presentation and to thank him for the opportunity of discussing it. He has so completely covered his subject as to leave little room for discussion; so it seems my role needs must be mainly to emphasize certain points to which he directed attention.

Perhaps the most important fact to be borne in mind is that operation, an absolute obligation in open craniocerebral injuries, not only may with safety be delayed many hours but frequently must be so postponed if one is to give the victim his best chance for recovery. Cushing's rule "all or nothing" will often necessitate delay in order to transport patients with such injuries to the proper place for operation; it is far better that they be untreated, except for shock and the application of sterile dressings, for hours or even days than that they be subjected to operation which must necessarily be incomplete because of the lack of proper equipment or trained personnel. The degree of unconsciousness is probably the best guide to the length of time the operation may be delayed; shock, if present, demands delay until the desired response is obtained to antishock therapy. If unconsciousness is so profound that it is impossible to arouse the patient even by the application of painful stimuli, operation will probably be of little avail; if this extreme degree of unconsciousness is not overcome by conservative measures, the patient is probably doomed. So, too, in shock; if it is not successfully combated, operation will only serve to push the patient over the edge upon which he is already teetering.

In spite of the fact that these are always infected wounds and that unnecessary delay is culpable, the interval of waiting is far from wasted. During this time prophylactic doses of antitetanic and anti-gas gangrene serum should be given, and sulfonamide therapy should be begun. Here it is well to recall that sulfathiazole is the least effective of the sulfonamides in the cerebral system because of its poor secretion by the cerebrospinal fluid. Scalp bleeding should be controlled. In cases of penetrating wounds localizing roentgen examination should be made. The typing of blood, obtaining donors and plasma, and cross-matching all take time, and this is the period in which to prepare for their use in case of necessity.

Although local infiltration anesthesia is the choice, some of the patients come to operation in an extremely restless state. In these cases it is well to use avertin by rectum in quieting doses and to use local anesthesia also.

Recalling the potentialities of infection in these wounds, one realizes the necessity of careful and full debridement not only of the scalp but also of the fragmented cranium. In debriding the cranium when one deals with depressed fragments, it is far wiser to avoid possible further injury to underlying structures by elevating the fragments through nearby burr holes than by attempting simple elevation or by nipping away edges of bone with rongeurs to free the depressed fragments. Removed fragments should be thoroughly washed in Ringer's solution and kept for replacement together with a quantity of sulfanilamide powder. Though it is not essential to replace these fragments, especially in small defects, they certainly serve a useful purpose in the eventual repair of the defect and enable one to avoid subsequent operative repair necessary in many instances prior to the advent of the sulfonamides.

Saving of all the dura possible so as to secure watertight closure of it is all important. Although Browder advised that a water-tight closure of the galea is preferable to the use of "foreign material," I take it that he does not object to autogenous grafting of fascia. Certainly if a mosaic of bone fragments is to be replaced, none of it should rest upon brain tissue. Undoubtedly the galea should be closed water-tight by means of many interrupted silk sutures so that it will compensate for small leaks through the dura or graft, but by all means one should make every attempt to close the dura snugly, using grafts if necessary.

All injured and devitalized brain tissue together with any possible foreign bodies should be removed by suction and alternate suction and irrigation with Ringer's solution through a small rubber catheter. It is surprising what can be removed in this manner. It is well to mention in this connection that instrumental search for deeply indriven foreign bodies should never be made. Deep-lying foreign bodies should be left unless localizing signs or symptoms are of sufficient importance to outweigh the possible damage to be inflicted by their attempted removal. Gentleness, even in the use of the soft catheter, is of paramount importance. The catheter should be allowed to follow the track of the missile rather than be pushed into it. Injuries to undamaged brain tissue will thus be avoided, especially to the ventricles, which, if unopened, should be left unalterably so. Even the present day free use of the sulfonamides has not allayed the fear of opening the ventricles in the presence of trauma.

Complete hemostasis in all surgery is an end to be desired; in surgery of the brain it is obligatory. Wounds involving the sinuses are apt to be particularly bloody and the bleeding hard to control. If a fragment of bone is depressed over a sinus and there is no free hemorrhage, it should be left alone for fear of tearing into the sinus. Bleeding from a sinus can be controlled by the use of pulpified muscle graft, dural transplant, or even by packing the sinus or by tying the torn ends.

In wounds involving the paranasal sinuses thorough debridement and chemotherapy are the main reliances. Chemotherapy should be used unsparingly both in the wound and orally or parenterally until the danger period of infection has passed.

In spite of careful preoperative conservatism, rigid debridement, gentle but thorough technic at operation and the wise use of chemotherapy, occasionally meningitis will occur, perhaps more frequently post-traumatic brain abscess, acute or chronic, and possibly still more frequently wound breakdown with resultant protrusion of a brain fungus and the development of cranial osteomyelitis. Since these are all complications or part of the aftermath of the scope of this discussion, they are mentioned only in the attempt further to emphasize points previously brought out.

It is not amiss, in a final word, again to warn against the use of narcotics and lumbar punctures in the postoperative care of compound craniocerebral injuries. Almost certainly unnecessary deaths have occurred by more deeply depressing with narcotics the already severely depressed brain. Certainly it is possible to spread by lumbar puncture any infection present.

DR. LYERLY (concluding): I want to thank Dr. Owens for his discussion, for bringing out some of the points which I did not have time to bring out, and for emphasizing those already stated.

I think when the patient has too severe an injury, or a complicating injury elsewhere in the body, and there has been a laceration, in which case one does not have to make an immediate repair, that operation might be delayed for several days by packing the wound immediately with sulfanilamide powder and leaving the wound open. But cases of this type are exceptional. Most cases must be treated by debridement within the first twenty-four hours.

Regarding sulfonamide drugs, I think the best one to be used is sulfadiazine. I do not use sulfapyridine or sulfathiazole in the more recent cases. When there is intracranial infection, I think sulfadiazine is the best.

In these cases the patient is operated on under local anesthesia in most instances.

After operation, in cases in which it is necessary to leave a cranial defect, one has two choices, to do a bone graft or use some foreign material such as a plate. Personally, I prefer the celluloid plate, although some metallic plates are satisfactory. The former is tolerated well ir these defects if the wound is clean. Foreign material should not be used in the repair of compound wounds during the first six months at least after operation, because there may be some latent infection.

It is important that the dura be closed tightly by using a graft from the temporal fascia or galea if necessary. The dura is a great barrier to infection, should it develop in the scalp wound. If the dura is closed, serious intracranial complications may be prevented.

THE MECHANISM OF VERTIGO

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Vertigo is a consciousness of a departure from the normal relationship of the body in space. It is a subjective symptom and, like pain or headache, may occur in connection with a great many physical conditions.

Equilibrium means an even adjustment between opposing forces. If this adjustment becomes uneven, equilibrium is lost, and vertigo results. The degree of vertigo is dependent on the nature and extent of the disturbing force and somewhat on its location.

The equilibrium is maintained by the coordination of impressions from three important body systems. These are the eyes, the labyrinth of the ears and the muscle-joint or tactile system. There must be agreement in the impressions sent in by at least two of these to maintain equilibrium. If the labyrinths are not functioning, as in a deaf-mute, the other two systems carry on. If the spinal pathways are cut off, as in tabes, the person so affected loses his sense of balance if he closes his eyes, which is the Romberg sign. The blind rely upon the other two systems to tell them their position in space.

In order to understand the mechanism of vertigo one must recognize certain definite anatomic and physiologic facts. Hair cells of the saccule and utricle send out neuraxons, which unite with others from the semicircular canals to form the vestibular part of the eighth nerve. This nerve ends on the dorsal side of the pons and medulla in three nuclei: (1) the dorsal nucleus, in the floor of the fourth ventricle, (2) the nucleus of the descending root and (3) the nucleus of Deiters, part of which is in the lateral wall of the fourth ventricle. The dorsal nucleus and the nucleus of Deiters are in intimate relation with the cerebellum in the direct sensory cerebellar tract, and this link-up between the vestibular nerve and the cerebellum has a special significance in connection with equilibrium. The fibers of

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this tract arise mostly from the roof cells of the cerebellum and cross the midline to end in the nucleus of Deiters on the opposite side, and possibly also in the sensory nuclei of certain other cranial nerves.

Deiters' nucleus sends sensory fibers down the anterior motor horns of the cord as far as the lumbar region. These are in close association with the motor cells of the cord, and control the deep sensory impulses from the muscles, tendons and joints. Disturbances recorded by these fibers give the unsteady gait and incoordinated movements in vertigo.

Other fibers connect Deiters' nucleus with (1) the oculomotor and visual nuclei through which the eyes exert their influence on equilibrium, (2) the nucleus of the vagus nerve and through it with the sympathetic system, hence the pallor, sweats, nausea, vomiting and cardiac symptoms associated with severe vertigo, and (3) the cortex of the temporal lobe of the cerebrum, considered the center for motion-sense. Thus the importance of Deiters' nucleus as a connecting link between the labyrinth and many of the important centers in the brain and spinal cord is apparent.

In normal states this interlocking control mechanism, which is mostly bilateral, is so poised that all movements and changes of position of any part of the body are compensated for, and the individual person maintains his proper relationship to things about him. But if any part of this system gets out of step with the system as a whole, that relationship is upset, and conflicting impressions are transmitted which the intelligence centers cannot coordinate. Things assume a relationship which, in the light of past experience, cannot be reconciled, and the resultant confusion becomes vertigo, which most patients speak of as dizziness. Also, if the impulses arising in the vestibular nerve at its origin in the labyrinth are unduly stimulated or retarded, dizziness and nystagmus result. This fact is made use of in making functional vestibular tests. Hot water stimulates and cold water retards the normal action.

With the labyrinth linked up so widely with centers in the brain and spinal cord, it follows that it can be affected by a great variety of influences acting in many areas. The nearer to the labyrinth the disturbing influence occurs, the more definite is the sensation of turning and the more pronounced the vertigo. This peripheral type is precipitated by movement, especially of the head. It comes on in attacks, and there is a definite impulse to move or fall to one side, or there may be a feeling of being pushed to one side.

When the disturbance is central in origin, the symptoms are less definite. The patient cannot give a clearcut description of his sensations, describing them more as an indefinite feeling of confusion and of things wavering before his eyes, with unsteadiness in gait and a desire to catch hold of something to keep from falling. This dizziness tends to come on when he is at rest and it is independent of movement.

Vertigo may occur in connection with a great many systemic conditions, notably the anemias and leukemias, arteriosclerosis, cardiovascular disease, gastrointestinal disturbances and endocrine disorders including the male climacteric. Toxins from focal infections in teeth, tonsils and sinuses, or from certain drugs such as quinine, tobacco, the salicylates and the sulfonamide group, by acting either directly or indirectly on the labyrinth may cause vertigo. In fact, it is now considered by many that Meniere's syndrome is caused by focal infection.

A rather persistent and not easily relieved form of vertigo occurs in older people, due to sclerosis of the cerebral vessels. It is probably caused by lack of proper oxygenation and is usually associated with loss of memory and lack of concentration. The presence of retinal arteriosclerosis offers a clue. The posterior inferior cerebellar artery lies in close association with the medulla and the cerebellum. Thrombosis of this vessel often causes rather severe vertigo, which tends gradually to disappear. This is in contrast to the vertigo due to arteriosclerosis which tends to be persistent and is not apt to yield to any form of treatment. Cerebral hemorrhage and thrombosis are often preceded by vertigo.

In this connection one must not, as patients often do, confuse syncope, which is due to temporary cerebral anemia, with vertigo. In the former, consciousness may be lost, momentarily at least, while in vertigo there can be no loss of consciousness, since consciousness is its prerequisite. There is also a sensation of rotation in vertigo not present in syncope.

Dizziness is frequently experienced in the type of gastrointestinal disturbances which is associated with chronic constipation and putrefactive conditions of the colon. These conditions exist mostly in persons past middle life. A course of calomel and salines usually clears up the dizzi-

ness promptly, but dietary and regulative measures to ensure a healthy intestine should be instigated.

Vertigo may occur in connection with a discharging ear. If it is mild, it suggests perilabyrinthitis and indicates the need for freer drainage, usually mastoidectomy. If the attack is severe, with nausea, vomiting, ataxia, nystagmus and deafness, it indicates an extension of the infection to the labyrinth itself, or possibly to the cerebellum, and more radical surgery is required. The external auditory canals should always be inspected, as foreign bodies and impacted cerumen may cause vertigo by pressure transmitted through the drum to the labyrinth. A nonpatent eustachian tube may also be a cause. Extension of a granuloma from the middle ear to the labyrinth may produce Meniere's symptom complex. Small doses of potassium iodide taken sufficiently long will frequently effect a cure in cases of this type.

With direct involvement of the vestibular apparatus of one side, either from irritation or from some destructive process, there is always spontaneous nystagmus and vertigo, due to disharmony in the impulses from the two labyrinths. This nystagmus is the true vestibular type consisting of a slow movement in one direction with a quick recovery movement in the opposite direction. Labyrinthine vertigo is rotary, and surrounding objects move in a plane corresponding to the plane of the nystagmus, while the body tends to fall in the direction of the slow movement. This latter fact may be considered diagnostic for disturbances of vestibular origin as in practically all others the tendency to fall is not in the direction of the slow movement.

Anything causing diplopia may produce vertigo. This occurs in the early stages of paralysis of the ocular muscles or of paresis. The vertigo increases when the eyes are turned toward the affected muscle and decreases when they are turned away from it. Hypophoria, even of small degree, is a common cause of vertigo.

If glasses are not properly fitted, or are not correctly centered before the eyes, diplopia, and hence often vertigo, may result. For example, a plus lens decentered out produces a prism base out, and a minus lens decentered out produces a prism base in. The amount of resulting image displacement would vary with the strength of the lens, and vertigo would occur when the two images could not be made to coincide. Vertigo due to ocular causes disappears when one or both eyes are closed. This is a simple method of ruling out other causes. I have observed that imbalance of the ocular muscles and improperly fitted glasses are the cause of many of the cases of vertigo coming to my attention.

Aviation furnishes proof of how important the eyes are in maintaining equilibrium. No matter how perfect the mechanism of his inner ear, a flyer cannot keep his ship on an even keel unless he can see the horizon, or unless he has learned to fly blind by his instruments and to ignore his vestibular sensations. Thus the eye, by fixing on a point of known relationship, in this case the horizon, can overrule the influence of the labyrinth in the maintenance of equilibrium. Vertigo may result when the eyes are confronted with some unaccustomed environment, as when one watches a rapidly moving train pass close by, or looks down from a height.

Intracranial tumors may be a cause of vertigo by the increased pressure they produce. This pressure is transmitted through the aquaeductus vestibuli to the labyrinthine fluid. If the labyrinth on one side is more irritable than that on the other, the resultant difference in the impulses set up produces vertigo. Tumors of the brain in the temporal lobe and near the fissure of Sylvius seem to induce vertigo more readily than do tumors elsewhere. This tendency is due no doubt to their action on the associated vestibular center in the temporal lobes. Acoustic nerve tumors or sclerosed vessels pressing on the eighth nerve are causes of vertigo, generally associated with deafness on the same side.

Vertigo following injuries of the head is probably due to concussion of the nerve cells in the labyrinth and is apt to be slow in clearing up. This is important to remember in dealing with accident cases. It is more common after basilar fractures than after fractures of the convexities.

Multiple sclerosis is a degenerative condition involving the brain stem. Its commonest and perhaps only symptom is vertigo, which may be transitory or persistent.

Many factors enter into the diagnosis of vertigo which may require cooperative study by the otologist and the internist as well as the neurosurgeon. The history is important. Factors to be considered include the associated symptoms, as nausea, sweats and diplopia; the relation to other conditions, as discharging ears, injuries of the head, constipation, age of the patient and habits

of life; the nature and duration of the attacks including the mode of onset, whether in short episodes as in the peripheral or labyrinthine type, or more continuous ones as in the central type.

Examination of the eyegrounds may reveal a choked disk, which is indicative of intracranial pressure and possible tumor. Vertigo is not a significant localizing symptom in tumors of the brain, as it may occur with tumors in any part of the brain. In psychogenic cases the patient feels that he is going to fall, especially when alone, and he does not experience rotatory sensations.

The triad symptoms of sudden deafness, tinnitus and vertigo are distinctive of Meniere's syndrome, and if the present theory that it is due to focal sepsis is correct, the treatment of this condition suggests itself. Histamine desensitization is being used with considerable success. In most cases the vertigo is promptly relieved, and the tinnitus is cured or greatly lessened, especially if the drug is given intravenously. There may still be justification, however, for the view that the site of the lesion is in the eighth nerve and not in the labyrinth and that the cure is effected by section of the vestibular part of that nerve.

The treatment of vertigo is directed at the cause. In many instances thorough elimination, rest and correction of dietary errors suffice. If there are ocular abnormalities, they should be suitably corrected. Surgery may be required in cases associated with a discharging ear and in cases of tumor of the brain. Foci of infection should be cleared up. Anemias, other blood dyscrasias and endocrine disturbances require appropriate medication. In cases of injury of the head the patient requires prolonged rest, freedom from worry and possibly some sedation. Those cases considered due to retention of sodium with a resultant waterlogging of the tissues require treatment consisting of a sodium-poor diet and the administration of six 7½ grain enteric-coated capsules of ammonium chloride or potassium nitrate (45 grains), three times daily with meals. This medication prevents the sodium from being retanied in the tissues. If given for three days and omitted for two days, it may be continued indefinitely.

SUMMARY

1. Vertigo is a symptom, not a disease entity.

2. An attempt has been made to describe the anatomic pathways through which vertigo acts and some of the conditions responsible for its occurrence.

3. The majority of the cases of dizziness I have seen have been due to some form of toxic absorption, particularly from chronic constipation and putrefactive conditions of the colon and from foci of infection elsewhere, or to refractive errors and imbalance of ocular muscles, or to cerebral arteriosclerosis.

4. Diagnosis can be facilitated by careful attention to the history and to the nature of the attacks, the preexisting conditions and the associated symptoms.

5. Treatment is directed at the cause.

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DISCUSSION

DR. W. C. MCCONNELL, St. Petersburg: I wish to thank Dr. Nickle for inviting me to come here and to congratulate him on his excellent presentation. He has done a great deal of work on it, and it covers a subject met in all fields of practice.

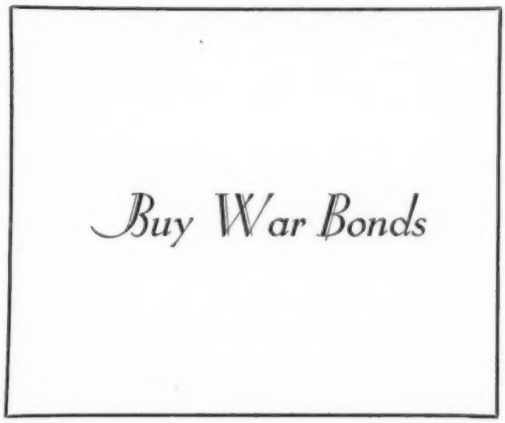
Although the symptom of vertigo is subjective, it is described as subjective when the patient feels that he is moving in space and as objective when he has the sensation that his environment is in motion about him.

There is a peculiar recurring type of vertigo that is observed in Switzerland and northern Japan. It attacks the young and robust during the summer months and is accompanied by pain and stiffness of the neck. An attack lasts ten minutes and leaves only to recur. After several seasons the patient fails to have attacks. The cause is unknown.

Neurosis is probably the most common cause of vertigo due to vasomotor instability. Tumors of the brain, especially cerebellar tumors, may cause vertigo. Frontal tumors, however, may irritate cerebellar tumors by pressure on the frontopontocerebellar tracts.

The ataxia associated with disease of posterior column of the spinal cord, such as occurs in tabes, may be differentiated from that of cerebellar disease because in the former it appears with the eyes closed and in the latter, use of vision does not change it.

The cerebellum serves as a governing organ for control of the higher centers. After symptoms of acute cerebellar lesions subside, the cerebrum assumes the function that has been lost by the cerebellum, and the ataxia abates.



ENCEPHALITIS COMPLICATING MEASLES

HUGH A. CARITHERS, JR., M. D.
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It appears probable that there has been an increase of encephalitis complicating measles in recent years. Although the degree of severity is widely variable and the signs are of a myriad quality, it is unlikely that cases escaped unnoticed before the last two decades, since which time there has been a decided increase in the number of reported cases. Laboratory data help but little in diagnosing the condition, and no new procedures have been developed that aid in diagnosis. Of the 11 cases seen at St. Luke's Hospital in the last sixteen years, which form the basis of this report, 7 occurred between January and May of 1942.

The cause of this complication is unknown. The theories advanced include (1) the invasion of the central nervous system by the virus of measles, (2) the invasion of the central nervous system by a neurotropic strain of this virus, (3) an allergic reaction within the central nervous system to this virus and (4) infection with a virus separate and distinct from the virus of measles. Unless the condition can be produced experimentally, its etiology will probably remain in question.

The English, German, Spanish, French and Portuguese literature was recently reviewed by Hamilton and Hanna,[1] who added 44 cases of their own. By reporting additional cases it is hoped that at some time a common characteristic may be discovered which will aid in diagnosis and that a rational treatment may be developed.

REPORT OF CASES

Case 1.—C. M., a white girl aged 4, was admitted to the hospital on April 2, 1934. Measles had developed on March 16, and she was allowed out of bed on March 25 after a "light" attack with little fever. That evening a sudden elevation of temperature and vomiting occurred. On March 26 she became unconscious and that night had convulsions. From March 27 until the time of admission she had frequent periods of unconsciousness lasting from five to ten minutes, or longer. The day before admission opisthotonus and a deviation of the eyes to the left developed.

She was admitted in an unconscious state. The temperature was 101 F. rectally, the pulse rate was 120, and respirations were 25 per minute. The eyes were deviated upward and to the left, and the pupils were slightly contracted. There was resistance to flexion of the neck. The day following admission the temperature was 101 F. rectally and gradually returned to normal. She remained comatose for two days and was fed intravenously. For the first six days there was weakness of the left hand. On the fourth day after admission stiffness of the right leg was noted, and there was an absence of abdominal reflexes. On the seventh day all reflexes were normal, but six days later absence of the left knee jerk was noted. She was discharged on April 16 without abnormal neurologic signs.

While on the ward she was never heard to talk, and it was not determined whether mental changes had taken place during her illness. A follow-up eight years later disclosed that the child is very "nervous and irritable," in pronounced contrast to her three siblings. She has never been promoted in school after six years of attendance. She has no motor disturbance or known physical defect.

Case 2.—W. McL., a white boy aged 12, was admitted on May 14, 1934. Measles had developed seven days before admission, and he was apparently recovering normally until the evening of admission when he had a convulsion. He was admitted in a state of coma with temperature of 102.8 F. rectally, a pulse rate of 140 and respirations 32 per minute. The Kernig reflex was positive, and Babinski signs were present bilaterally. There was an absence of superficial reflexes. Two days later, on May 16, the child could be aroused, but his mentation seemed dulled. The abdominal reflexes were absent, and there was ptosis of the right upper eyelid. On May 17 he seemed entirely recovered and on May 19 was discharged without abnormal signs.

Case 3.—W. P., a white boy aged 10 months, was admitted on March 6, 1938. He had had measles beginning fifteen days before admission and seemed to have recovered within one week. On March 4 an extremely severe headache and some fever were noticed. On admission, the temperature was 104 F. rectally, the pulse rate was 105, and respirations were 30 per minute. The temperature soon rose to 104.8 F. Examination by a neurologist a short time after admission revealed generalized hyperactive reflexes and slight stiffness of the neck. There was bilateral nystagmus. The veins of the fundi were engorged. The cranial nerves were normal, and there were no palsies. Two days later the child seemed entirely recovered and he was discharged on March 13.

Case 4.—L. Y., a white boy aged 2, had a rash typical of measles two days before admission. A sibling had recently recovered from the disease. The onset was rather severe with high fever and great irritability. On the morning of admission the child had a convulsion. He was admitted unconscious in a tonic state, with occasional clonic twitchings. The temperature was 103.6 F. at this time. Following a spinal tap and administration of a barbiturate by rectum, he seemed improved, but clonic convulsions continued intermittently throughout the day until death occurred that evening. Cyanosis was severe despite continuous inhalation of oxygen. The temperature gradually rose to 107 F. at the time of death. Careful physical examination revealed no concurrent infection. While no roentgenograms were made, there were no signs of pneumonia. The ear drums appeared normal. A postmorten examination revealed "pulmonary congestion, acute dilatation of the cardiac auricles, and cloudy swelling of the liver and kidneys with passive congestion of these organs." Permission was not granted for examination of the brain or spinal cord. It was assumed that the principal pathologic change was in the central nervous system.

Case 5.—K. T., a white girl aged 11 months, was admitted on Feb. 7, 1942, with a history of having had measles two weeks previously. She had apparently recovered without complications, but five days before admission, on February 2, there developed a "cold without fever." On the day of admission she had five separate convulsive seizures involving the right side of the body before entering the hospital. On admission, the temperature was 102 F. rectally and it did not rise above this level. She was conscious, but there were some twitchings of the muscles of the right lower extremity. She would not move her right arm or leg. The patellar

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reflex on the right was decreased, and there was a positive Babinski reflex on that side. The following day the child seemed improved, but twitchings of the eyelids and face on the right side were noted. Use of the right arm and leg returned gradually and seemed normal on February 28, the date of discharge.

Case 6.—A. C., a white girl aged 6, had measles seven days before admission on Feb. 27, 1942. She seemed to be recovering uneventfully until the day of admission when she had a generalized clonic convulsion. On admission, the temperature was 103.4 F. rectally. She was in a convulsive state and continued to have seizures for twenty-four hours. For the following three days she was only semiconscious, and it was necessary to administer fluids intravenously and subcutaneously. The temperature remained normal after three days. Neurologic signs varied from day to day. One week after admission the left arm and both legs were in a spastic state, and she was apparently unable to talk. A few days later it was noted that her mouth was pulled to the right. She was discharged on March 12 and has subsequently been admitted to Hope Haven Hospital. Three months after the onset she has the appearance of a child in a spastic state. She is mentally alert, but is unable to walk without support, and coordination of the lower extremities is poor. Her speech is slurred and slow.

Case 7.—D. B., a white boy aged 8, was admitted on March 5, 1942, six days after the rash of measles had developed. He seemed well that morning until he suddenly had a violent generalized clonic convulsion. On admission to the hospital the temperature was 101.6 F. rectally, the pulse rate was 130, and respirations were 40 per minute. Cyanosis was severe. Because of the convulsive movements two attendants were required to hold him on the bed. After the administration of oxygen, chloroform, a barbiturate intravenously, chloral hydrate and sodium bromide by rectum, and magnesium sulfate intramuscularly, the convulsion ceased. About four hours later he had another generalized clonic convulsion that lasted about fifteen minutes. The following day he was irrational, and there was an absence of all tendon, abdominal and cremasteric reflexes. On the second day following the attack he was rational, and the reflexes were present but weak. During the next three days he apparently recovered completely, and he was discharged on March 10. Several examinations up to two months following the attack revealed no residual signs.

Case 8.—S. K., a white girl aged 15 months, was admitted on March 20, 1942. The classical rash of measles had developed three days previously. The day of admission she had generalized muscular seizures described as "twitchings." At home the temperature was 100 F. rectally. On admission, it was 99.4 F. rectally, the pulse rate was 132, and respirations were 28 per minute. She was drowsy, but could be aroused. She had an apprehensive appearance. She vomited once. The temperature remained normal, and in two days she seemed fully recovered.

Case 9.—G. M., a white girl aged 3 years, was admitted on March 28, 1942. Six days before, the rash of measles had developed. She was recovering normally until the day of admission when she suddenly vomited and shortly thereafter became unconscious. On admission, the temperature was 101 F. rectally, the pulse rate was 125, and respirations were 32 per minute. The face, arm and leg on the right side were twitching, and the left leg was in a spastic state. She was unconscious, and saliva was drooling from her mouth. The next day she was still irrational, and it was noted that the pupils were dilated. Two days after admission she was talking normally. She was discharged on April 1. For the following two days she complained of pain in the left foot and refused to walk. After that time no residual signs were noted.

Case 10.—W. B., a white boy aged 7, was admitted on April 8, 1942. A rash typical of measles had developed four days before, but had faded by the time he entered the hospital. On the day of admission it was noted that he was unusually irritable and drowsy. He complained of severe headache, and incoordination and trembling of the hands were noted. On admission, the temperature was 103 F. rectally, and it descended to normal in thirty-six hours. He was drowsy and very irritable when aroused. The positive physical signs were confined to the nervous system. There was a positive Brudjinski sign. The abdominal and patellar reflexes were absent. A Babinski sign was present bilaterally, and an ankle clonus on the left side was noted. The following day he remained stuporous. Two days after the onset he was more alert, and the neurologic signs had disappeared except for the absence of knee jerks. He was discharged on April 12 completely recovered.

Case 11.—M. H., a white girl aged 8, was admitted on April 11, 1942. The rash of measles had appeared four days before. She seemed to have a light case, but on the day of admission she had a generalized clonic convulsion. She was unconscious when she was admitted to the hospital. The temperature was 103.8 F. rectally, the pulse rate was 130, and respirations were 45 per minute. Stiffness of the neck was present. Reflexes of the upper extremities were normal, but the abdominal reflexes and the knee and ankle jerks were absent. There was a positive Kernig sign. It was necessary to feed the child by vein until consciousness was regained the following day. She did not seem to comprehend speech until the fourth day after admission, and it was feared that she was deaf until that time. She was discharged on April 18, without residual signs.

DISCUSSION

Incidence—According to Hoyne,[2] who analyzed the measles epidemic of 1938 in Chicago, about 1 case of encephalitis per thousand cases of measles may be expected. Because of inaccurate reporting of cases, a definite incidence is difficult to determine. Hamilton and Hanna[1] concluded that the number of cases of encephalitis will be proportional to the number of cases of measles in the community. In this smaller series, this conclusion was not confirmed. As shown in table 1, the number of cases of measles reported in Jacksonville from 1932 until May 1942 compared with the number of cases of encephalitis associated with measles seen during that time at St. Luke's Hospital, where the only isolation department in the city is located, indicates a disproportion probably more than coincidental. In the epidemic of 1941, when 8,211 cases were reported, there was only 1 case of encephalitis. In the first four months of 1942, when 979 cases were reported, 7 cases of encephalitis were treated there.

Age and Sex—In the cases reported the age of the patient ranged from 10 months to 12 years, with an average of 4.8 years. The age incidence shows a close parallelism to the age incidence of measles in general. Five of the cases occurred in

boys and 6 in girls. No sex predilection has been noted in larger series.

Onset—Like the signs and symptoms of the disease, the onset is variable. While it is known that encephalitis may occur before the rash during the period of invasion, it nearly always follows the disease, as in all of the cases presented. The shortest period after the appearance of the rash in this series was two days and the longest thirteen days, with an average of six and three tenths days. Frequently this complication develops after the acute phase of the attack of measles has subsided. A convulsion, usually sudden, is a frequent initial phenomenon.

Signs and Symptoms—The brief case histories given indicate that neurologic signs may be expected and that they will be variable from case to case and from day to day. No common characteristic is discernible. In 9 of the 11 cases the patient had convulsions, and because such seizures without primary neurologic disease may produce bizarre neurologic changes, some of these changes may be due to convulsions alone. High fever did not always accompany the convulsions, as in case 5, in which the patient's temperature did not rise above 102 F. despite five distinct seizures, and in case 8, in which the patient had no fever. At some time during the course of the disease, in 7 of the cases paralysis of one or more groups of muscles occurred. The condition was usually transient and would frequently shift from day to day. Disturbances of the upper motor neurons resulting in hyperactive tendon reflexes and positive Babinski reflexes were also usually noted at one or more examinations. Pathologic changes in the eye grounds were observed in 1 case. Sensory perception, always difficult to determine in young children, was probably affected in some of the cases by drugs used to control convulsions. Clinical data are summarized in table 2.

Laboratory Findings—As indicated in table 3, the white blood count is frequently, but not consistently, elevated. In all of the cases of this series in which counts were taken, there was a leukocytosis except in case 8. Perhaps there was a stimulation to white blood cell formation in this case as well, since it would be expected that on

TABLE 1

MEASLES REPORTED IN JACKSONVILLE FROM 1932 TO MAY 1, 1942
ENCEPHALITIS COMPLICATING MEASLES SEEN AT ST. LUKE'S HOSPITAL FROM 1926 TO MAY 1, 1942

Year	1926-32	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942 Jan.-Apr.
Reported cases of measles		35	686	2893	108	29	42	3473	61	64	8211	979
Cases of encephalitis	0	0	0	2	0	0	0	1	0	0	1	7

TABLE 2

SUMMARY OF CLINICAL DATA

Name	Case Number	Date of Admission	Sex	Age	Onset After Rash in Days	Convulsions	Maximum Temperature	Death	Residual Signs
C. M.	1	4/2/34	F	4 yrs.	11	yes	105	no	Emotional instability; mental retardation
W. McL.	2	5/14/34	M	12 yrs.	7	yes	105	no	none
W. P.	3	3/6/38	M	10 yrs.	13	no	104.8	no	none
L. Y.	4	5/19/41	M	2 yrs.	2	yes	107 at death	yes	——
K. T.	5	2/7/42	F	11 mos.	14	yes 5 before admission	102	no	none
A. C.	6	3/27/42	F	6 yrs.	7	yes	102	no	Spasticity; muscular incoordination
D. B.	7	3/5/42	M	8 yrs.	6	yes	103	no	none
S. K.	8	3/20/42	F	15 mos.	3	yes	none	no	none
G. M.	9	3/28/42	F	3 yrs.	6	yes	102	no	none
W. B.	10	4/8/42	M	7 yrs.	4	no	103	no	none
M. H.	11	4/11/42	F	8 yrs.	4	yes	104	no	none

TABLE 3
SUMMARY OF LABORATORY FINDINGS

Case No.	Spinal Fluid					Blood Count	
	Pressure	Cells	Protein	Kahn	Culture	White Count	Differential
1	no increase	2 L	Pandy negative		negative	16,650	Band 7 Seg. 71 L 20 M 2
2	slight increase	9 L		negative		11,000	P 73 L 26 E 1
3	3/6 increase 3/7 no increase	3/6 1 L 3/7 1 L 1 P	negative	negative		23,650	Juv. 1 Band 34 Seg. 47 L 13 M 5
4	no increase	2 P 6 L	0.3 Gm. liter	negative		11,350	Seg. 76 L 24
5	2/7 200 mm. 2/9 100 mm.	2/7 2 L 2/9 2 L 1 P	0.27 Gm. liter Globulin negative			11,300	Band 5 Seg. 59 L 36
6		8 P 22 L	Globulin 2 plus		negative	34,600	Juv. 2 Band 38 Seg. 30 L 10
7	3/5 100 mm.	27 L 3 P	Globulin 2 plus		negative	29,150	Juv. 1 Band 19 Seg. 73 L 6
8		0	Globulin 1 plus			8,500	Myelc. 2 Juv. 8 Band 30 Seg. 20 L 33
9	no increase	14 L		Wassermann negative			
10		28 P 58 L	Pandy 2 plus	negative			
11	no increase	26 L 18 P	Pandy 2 plus	negative		17,800	Band 11 Seg. 66 L 23

the third day after the appearance of the rash of measles a leukopenia would be present. Examination of the spinal fluid gives inconsistent results. While it may be expected that in a majority of cases the spinal fluid will show (1) an increase of pressure, (2) an increase of cells, particularly lymphocytes, and (3) an increase of protein, one or all of these findings may be absent.

Pathology—Pathologic studies by Malamud[3] and others revealed that there is a predilection of the lesions for the white matter of the central nervous system. There occur an exudation of hematogenous elements and a proliferation of microglia, that later are replaced by gitter cells that may be engorged with fat. The case reported by Ziskind and Schattenberg[4] is interesting particularly because the patient lived eight months, and therefore late changes were observed. The blood vessels of the central nervous system were congested, and there was a perivascular microglia proliferation with some lymphocytic infiltration. Some demyelinization with occasional phagocytic cells containing fat was noted.

Prognosis—Hamilton and Hanna,[1] who have recorded the greatest number of cases, stated that in approximately 40 per cent of cases recovery is complete, in 40 per cent there are residual signs, and in 20 per cent death ensues. Ford,[5] reviewing 125 cases, noted that the mortality was 10 per cent and that residual signs were present in 65 per cent of the cases. In two series Peterman and Fox[6] reported a total of 27 cases with a mortality of 29.6 per cent. In the smaller series presented here the mortality was 9 per cent with residual signs in 17.2 per cent.

Treatment—There is no specific treatment for encephalitis complicating measles. The use of convalescent serum or immune globulin is not indicated since, as Rivers[7] pointed out, when a virus invades the central nervous system, an irreversible reaction is set up. By the time signs

of encephalitis complicating measles appear, it is too late for immune bodies to be beneficial. Hamilton and Hanna[1] employed intravenous typhoid shock therapy in a small number of cases, and while no conclusions can be drawn, this procedure may prove to be of value.

In all except two of the cases of this series the patient had convulsions. The frequency of convulsive seizures has been noted in other series.[6] In the fatal case of this series the convulsive state was not relieved. Convulsions from any cause should be relieved as soon as possible because of the possible irreparable damage that they may do to the central nervous system. Particularly in this condition, when repeated convulsions occur frequently, the physician must not only stop the present convulsion, but do all in his power to prevent a subsequent one. The following routine has been time-proved:

1. Use of a general anesthetic as an emergency measure. Ether, chloroform or vinyl ether may be used. I prefer the latter two agents because their action is quicker and their depressant action greater, but it is to be remembered that the margin of safety is not as great as with ether.

2. Oxygen inhalation if there is cyanosis.

3. If the convulsions are not promptly relieved by the general anesthetic, sodium amytal, 1/25 grain per pound of body weight with a maximum dose of 3 grains, may be administered intravenously.

4. A spinal tap, done for diagnosis and to reduce intracranial pressure, is not attempted until the convulsive movements have abated.

5. Administration of a cleansing enema.

6. Sedatives given rectally. Sodium bromide, ¾ grain per pound of body weight, and chloral hydrate, 1/10 grain per pound of body weight, administered together are effective and safe. In recent years pentobarbiturates have become popular. They may be given in solution or as a suppository. Between 1/25 and 1/50 grain per pound of body weight may be used, depending on the amount of sedation desired. If sodium amytal were previously given intravenously, chloral hydrate and bromides would be preferred to pentobarbiturates.

7. From 0.1 to 0.15 cc. per pound of body weight of a 25 per cent solution of magnesium sulfate given intramuscularly.

8. When consciousness is regained, a relatively large dose of saline cathartic, and bromides given for several days by mouth, unless the condition appears to be relieved, or unless the routine outlined has caused great depression.

SUMMARY

1. Eleven cases of encephalitis complicating measles are presented.

2. Variability of signs and symptoms, a consistent characteristic of the disease, is illustrated by these cases.

3. A leukocytosis was present in all except one of the cases in which blood counts were made.

4. The results of examination of the spinal fluid were inconsistent.

5. Therapy is discussed, and the treatment of convulsions, which occurred in all but two of the cases, is outlined.

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A DOCTOR'S PLEA IN WARTIME

The doctor's life, in times like these,
Is not exactly one of ease.

For, on the home front, each M. D.
Is busier than any bee!

He's shouldering the burden for
The other docs, who've gone to war.

This leaves your doctor precious little
Time to sit around and whittle.

And indicates the reason why
You ought to help the poor old guy.

How?

1. *By keeping yourselves in the best of condition*
Thus avoiding the ills that demand a physician.

2. *By phoning him promptly when illness gives warning,*
But—unless very serious—waiting till morning.

3. *By cheerfully taking whatever appointment*
He makes for prescribing his pills or his ointment.

4. *By calling on him where he works or resides*
Instead of insisting he rush to your sides.
(Of course, he'll come 'round when there's need for his service
But spare him the trip when you're nothing but nervous.)

5. *And, last but not least, you can help in this crisis*
By carefully following Doctor's advices.

If these commandments you'll adhere to
A doctor's heart you will be dear to!

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Edward Jelks, M.D...B-44.....*Jacksonville*
Joseph W. Taylor, M.D...C-46.....*Tampa*

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Alvin L. Mills, M.D...C-46.....*St. Petersburg*
Wiley M. Sams, M.D...D-45.....*Miami*
Joe I. Turberville, M.D...A-44.....*Century*
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Robert G. Nobles, M.D...A-43.....*Pensacola*

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*George D. Lilly, M.D. (Alternate).....*Miami*
Rollin D. Thompson, M.D...B-45.....*Orlando*

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Councill C. Rudolph, M.D...C-46.....*St. Petersburg*
Alvyn W. White, M.D...A-43.....*Pensacola*

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Carl E. Dunaway, M.D...D-44.....*Miami*
Sherman B. Forbes, M.D...C-45.....*Tampa*
Hollis C. Ingram, M.D...AL-43.....*Orlando*
William S. Nichols, M.D...A-43.....*Lake City*

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Lawrence C. Ingram, M.D...AL-43.....*Orlando*
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Third—Lucien Y. Dyrenforth, M.D...3-43 *Jacksonville*
Fourth—Meredith Mallory, M.D...4-44.....*Orlando*
Fifth—Leland F. Carlton, M.D...5-44.....*Tampa*
Sixth—S. Edgar Watson, M.D...6-43.....*Lakeland*
Seventh—William Y. Sayad, M.D...7-43 *W. Palm Beach*
Eighth—Elbert McLaury, M.D...8-44.....*Hollywood*

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George M. Dawson, M.D., Alternate..*West Palm Beach*
(Terms expire Dec. 31, 1943)
Edward Jelks, M.D., Delegate.....*Jacksonville*
O. O. Feaster, M.D., Alternate.....*St. Petersburg*
(Terms expire Dec. 31, 1944)

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William M. Rowlett, M.D., 1933.....*Tampa*
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Herbert L. Bryans, M.D., 1935.....*Pensacola*
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Edward Jelks, M.D., 1937.....*Jacksonville*
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*Alternate to act for member who is in Armed Services and listed just above.

The Journal of The Florida Medical Association

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PROCUREMENT AND ASSIGNMENT HEADS MEET IN ATLANTA

On December 17 and 18, 1942, there was held in Atlanta a conference of state and corps area officials of the Procurement and Assignment Service, officers of allied organizations and representatives of the United States Public Health Service.

The meeting was conducted by Dr. Maxwell E. Lapham, Executive Officer of the Procurement and Assignment Service in Washington. Dr. James E. Paullin of Atlanta, president-elect of the American Medical Association and member of the National Board of the Procurement and Assignment Service, opened the meeting by giving a summary of what had been accomplished through 1942. The Southeastern States, which were the ones represented at this meeting, had all met the quota of doctors which had been set for them.

The United States Public Health Service was represented by Dr. Carl E. Rice, Senior Surgeon, Dr. C. L. Williams, Senior Surgeon District No. 4, United States Public Health Service, and others.

The chief object of the meeting was a presentation of the problems for next year and a discussion of a program through which they could be solved. The main problem in Florida, it appears, will be providing physicians for "critical areas." By that is meant a local shortage of physicians due either to the loss of doctors to the military services, or to an increase in population too great for the physicians who are already practicing in the community. There are several such areas in our state. Your Procurement and Assignment Committee, in conjunction with the chairman of the Medical Division of the State Defense Council, and with the cooperation of the State Board of Medical Examiners, is endeavoring with encouraging success to locate doctors in these areas.

It was evident to everyone present that if the medical needs of the various communities are to be met, it will be necessary to have on file information much more complete and more accurate than that which is now available. Anticipating such a need the state chairman on Procurement and Assignment in Florida had a meeting about three weeks prior to the one in Atlanta and adopted a method for obtaining this information, which interestingly enough is almost exactly like the one which was presented at the conference in Atlanta. Each doctor now in the state will have a special index card upon which is noted information obtained locally concerning him. The Procurement and Assignment Committees will classify again every doctor in the state. In deciding upon a classification the need for civilian medical attention will be considered, along with the possibility of increased need for doctors in the military services. The files thus compiled will be a ready help to everyone charged with the responsibility of obtaining doctors for the military services and preserving the high standard of civilian medical care.

The State Committee is desirous of obtaining the name of every doctor who is willing to be moved from one portion of the state to another to meet some urgent local need. Dr. Frank H. Lahey, Chairman of the Directing Board of the Procurement and Assignment Service of Washington, recently issued the following statement:

> It is of the utmost importance that the Procurement and Assignment Service for Physicians, Dentists, and Veterinarians, immediately have the name of any doctor who really is willing to be dislocated for service, either in industry or in over-populated areas, and who has not been declared essential to his present locality. This is necessary if the medical profession is to be able to meet these needs adequately and promptly. We urgently request that any physician over the age of 45 who wishes to participate in the war effort send in his name to the State Chairman for the Procurement and Assignment Service in his state.

MEDICAL POSTGRADUATE COURSE

The Tenth Annual Graduate Short Course for doctors of medicine, held June 22-27, 1942, in Jacksonville had the largest registration so far recorded. The total registration was 195, of which 148 paid the registration fee. In the May issue of the Florida Medical Journal a complete program and the names of the faculty members were published. The Association's Committee on

Medical Postgraduate Course has made an enviable record under the leadership of Dr. T. Z. Cason who has served as the head of this committee for the past ten years. The outstanding physicians who served as faculty members have brought to the Florida doctors a course that has been of exceptional value to the practitioners who participated.

The finances of this committee have at all times been in excellent condition. Receipts through the $5.00 registration fee have a little more than covered all of the committee's expenses during the ten-year period. The financial statement submitted by Dr. George C. Tillman, treasurer, as of October 1, 1942, follows:

Cash on hand October 1, 1941		$ 614.99
Florida Medical Association, January 22, 1942, by check		500.00
Paid Registration Postgraduate Course, 1942, 148 at $5.00		740.00
Total		$1,854.99
Check No. 92, Miss Jean Kennedy, salary	$100.00	
Check No. 93, Miss Jean Kennedy, stamps	10.00	
Check No. 94, Dr. R. B. Cattell	117.85	
Check No. 95, Dr. Alton Ochsner	130.00	
Check No. 96, George Washington Hotel	72.71	
Check No. 97, Miss Hazel Donegan, stamps	10.00	
Check No. 98, Dr. Robert W. Wilkins	193.37	
Check No. 99, Pepper Printing Company	6.00	
Check No. 100, Dr. Harold E. Harrison	15.00	
By cash Miss Hazel Donegan, Secretary	25.00	
Total	$679.93	
Balance on hand October 1, 1942		$1,175.06

(Signed) George C. Tillman.

According to Dr. Cason's statement, there is one obligation amounting to $100.00, still outstanding, and a check for $35.00 was received since the financial statement was prepared.

SOUTHERN MEDICAL MEETING

The annual meeting of the Southern Medical Association, held in Richmond, November 10 to 12, 1942, was of unusual interest. Nearly 1,400 physicians were in attendance, a registration which under present conditions, surpassed all expectations. At the previous meeting the registration was approximately 3,000. Members of the Florida Medical Association who attended were:

Chiefland: William C. Young. *Gainesville*: John E. Maines, Jr., DeWitt T. Smith. *Jacksonville*: Alan Brown, Henry Hanson, O. E. Harrell, Luther W. Holloway, R. R. Killinger, T. H. Lipscomb, J. G. Lyerly, Robert B. McIver, James N. Patterson, Harry A. Peyton, C. D. Rollins, C. M. Sandusky. *Kissimmee*: Avaline N. Lancaster. *Miami*: Walter C. Jones, John D. Milton, J. Randolph Perdue, Jean Jones Perdue, John W. Snyder. *Miami Beach*: William Linder, Harrison A. Walker. *Ocala*: Eugene G. Peek. *Orlando*: E. L. Jewett. *Tampa*: C. A. Andrews, H. M. Cook, H. Mason Smith. *West Palm Beach*: Lloyd J. Netto. *Winter Park*: Ruth S. Hart, Rosalie S. Morton.

MEMBERS IN ARMED SERVICES

Names and addresses of doctors in the Armed Services, received since the list was published in the November and December Journals:

ALACHUA

Collins, Grover C. ..... Gainesville

DADE

Agos, I. H. ..... Miami Beach
Harris, Robert M. ..... Miami

DUVAL

Hanson, Karl ..... Jacksonville
King, F. Gordon ..... "
Lipscomb, T. H. ..... "
Patterson, James N. ..... "

MANATEE

Floyd, Alva J. ..... Palmetto

PINELLAS

Meyer, Francis P. ..... St. Petersburg
Murphey, Dan'l F. H. ..... "

POLK

Bond, Benjamin J. ..... Winter Haven

SARASOTA

Powers, Earl J. ..... Blanchester, O.

VOLUSIA

Vallotton, J. Ralph ..... Daytona Beach

RETURNED TO PRIVATE PRACTICE

Haisfield, H. B. ..... Pensacola
Howdon, Wm. M. ..... Miami
Jefferson, Curtis B. ..... Tampa
Kaplan, Saul H. ..... Miami Beach

DONATIONS FOR PURCHASE OF WAR BONDS

Under the plan sponsored by the Board of Past Presidents, the following donations have been received for the purchase of war bonds to offset dues of members in the Armed Services:

ALACHUA COUNTY $25.00
Thomas, W. C., Gainesville

BAY COUNTY 5.00
Adams, Powell, Panama City

BREVARD COUNTY 5.00
Kenaston, T. C., Cocoa

BROWARD COUNTY 360.00
Blessing, Robert, Ft. Lauderdale
Robinson, Leigh F., Ft. Lauderdale
(From Society Treasury $250.00)

COLUMBIA COUNTY 18.75
Harkness, R. B., Lake City

DADE COUNTY 106.88
Jones, Walter C., Miami
Norman, Estella G., Battle Creek, Mich.
Stoddard, Guy R., Miami Beach
Walker, Harrison A., Miami Beach
Welch, P. B., Miami

DESOTO-HARDEE-HIGHLANDS-CHARLOTTE-GLADES COUNTY 18.75
Simmons, J. A., Arcadia

DUVAL COUNTY 1,003.75
Adams, Mark E., Jacksonville
Baker, Lynne E., Jacksonville
Brown, Alan, Jacksonville
Chilli, Joseph L., Jacksonville
Field, Thomas S., Jacksonville
Harrell, O. E., Jacksonville
Holden, Gerry R., Jacksonville

Jelks, Edward, Jacksonville
Limbaugh, Louie, Jacksonville
Lyerly, J. G., Jacksonville
McGinnis, Robert H., Jacksonville
McIver, Robert B., Jacksonville
Peyton, Harry A., Jacksonville
Provinsky, Leo B., Jacksonville
Richardson, George W., Jacksonville
Richardson, Shaler, Jacksonville
Ross, William E., Jacksonville
Royce, C. E., Jacksonville
Shaw, W. McL., Jacksonville
Taylor, H. Marshall, Jacksonville
Van Schaick, H. D., Jacksonville
Waas, F. J., Jacksonville
Wachtel, Leo M., Jr., Jacksonville
Wilson, J. Frank, Jacksonville
Woolsey, Bertram F., Jacksonville

ESCAMBIA COUNTY 36.50

Pierpont, J. H., Pensacola

HILLSBOROUGH COUNTY 662.25

Adamson, W. P., Tampa
Boling, John R., Tampa
Cook, George L., Tampa
Dickinson, J. C., Tampa
Duke, R. R. Tampa
Duncan, W. P., Tampa
Gilbert, Elsie, Tampa
Gilmer, E. S., Tampa
Griffin, J. C., Tampa
Jensen, H. J., Tampa
Lott, H. B., Tampa
Lowry, B. W., Tampa
Maguire, T. C., Plant City
Maner, George R., Tampa
Moore, J. T., Tampa
Rowlett, W. M., Tampa
Smith, H. Mason, Tampa
Woodburne, A. W., Tampa

LEE COUNTY 37.50

Bartleson, Fred D., Ft. Myers
Bostelman, Ernest, Ft. Myers

LEON-GADSDEN-LIBERTY-WAKULLA-JEFFERSON COUNTY 144.00

Brinson, J. B., Monticello
Davis, Julius C., Quincy
Palmer, Henry E., Tallahassee
Pound, J. H., Tallahassee
Rhodes, B. M., Tallahassee
Ruediger, E. Henry, Chattahoochee
White, Sarah Parker, Tallahassee

ORANGE COUNTY 10.00

Kirk, A. C., Orlando

PALM BEACH COUNTY 58.75

Ditman, Norman E., Palm Beach
George, W. W., West Palm Beach
Johnson, V. M., West Palm Beach
Stephens, Edgar W., West Palm Beach

PASCO-HERNANDO-CITRUS COUNTY 18.75

Jones, W. Wardlaw, Dade City

PINELLAS COUNTY 10.00

Palmer, H. G., St. Petersburg

POLK COUNTY 187.50

Boulware, J. R., Lakeland
Dunham, Kenneth, Frostproof
Gilchrist, J. G., Bartow
Griffin, J. D., Lakeland
Horton, Waldo, Winter Haven
Meriwether, W. G., Mulberry
Pearce, C. C., Mulberry
Tillis, W. L., Lakeland
Watson, Edgar, Lakeland
Watson, Herman, Lakeland

ST. JOHNS COUNTY 47.50

Lockwood, Vernon A., St. Augustine
White, Herbert E., St. Augustine

VOLUSIA COUNTY 5.00

Howe, Raymond, Daytona Beach

BIRTHS, MARRIAGES AND DEATHS

BIRTHS

Dr. and Mrs. Saul D. Rotter of Lake Worth announce the birth of a daughter, Patricia Ann, on November 17.

Dr. and Mrs. F. H. Bowen of Jacksonville announce the birth of a daughter, Henrietta Baldwin, on November 3.

Dr. and Mrs. Karl B. Hanson of Jacksonville announce the birth of a daughter, Jane Boyles, on January 9.

MARRIAGES

Dr. William R. Wandeck of Marianna and Miss Virginia Kirkland of Metter, Ga., were married on November 4.

Dr. James L. Estes and Miss Mays Sanford of Tampa were married on December 19.

DEATHS

Dr. William J. Williams of Cassia died on December 22, 1942.

Dr. William P. Adamson of Tampa, Life Member and former president of the Florida Medical Association, died on January 3, 1943.

STATE NEWS ITEMS

Dr. C. A. Rudisill, formerly of Tampa, now a lieutenant commander in the Navy, received the Naval Reserve medal for efficient and faithful service at the Naval Hospital in Jacksonville recently.

Dr. P. T. McClellan was recently appointed health officer for the city of Vero Beach.

Dr. W. W. Rogers was appointed health officer of the city of Jacksonville, in December, to succeed Dr. N. A. Upchurch who retired. Dr. Rogers has been connected with the Health Department of Jacksonville for the past fourteen years, and received unanimous approval for appointment by members of the city commission.

Dr. H. V. Weems of Sebring was principal speaker at a recent meeting of the local Rotary Club. Dr. Weems' subject was "Rotary International and Rotary Doctrine."

Florida physicians have been organized into five base hospital units for wartime protection of the civilian population. Dr. Gilbert S. Osincup of Orlando, chairman of the Health and Housing Division of the State Defense Council, stated that each unit will be composed of 15 physicians who will be based at Pensacola, Jacksonville, Orlando, Miami and Tampa. Members will be given com-

missions, inactive status, in the U. S. Public Health Service Reserve, and will be called to active duty in case of grave emergency. The five Florida units are a part of a total of 24 in six southeastern states.

DAVID ROSE

Dr. David Rose, one of the pioneers in medicine in southeastern Florida, died at a Vero Beach Hospital on December 5. He was born in Port Dover, Ontario, Canada, in 1854.

Dr. Rose practiced in Waterford, Ont., Chicago and Oklahoma City before coming to Florida in 1908. For many years he was the only physician between Titusville and Fort Pierce, and he served the area faithfully, although in the beginning he had to visit his patients on horseback or on foot. For many years he served as local registrar for vital statistics in his district.

Longevity was a characteristic of his family, and five members of his mother's family lived an average of 85 years.

Dr. Rose is survived by his widow, Mrs. Elizabeth Wegener Rose, and a daughter, Mrs. Edith Suddeard, both of Sebastian.

COMPONENT COUNTY SOCIETIES

ALACHUA

The members of the Alachua County Medical Society and of its Auxiliary were guests of Dr. and Mrs. Thomas A. Snow at a buffet supper on December 9.

BROWARD

The following officers were elected by the Broward County Medical Society at its annual meeting held at the Broward General Hospital, Ft. Lauderdale on December 9: president, Dr. D. W. Harris, Ft. Lauderdale; vice president, Dr. Robert Blessing, Ft. Lauderdale; secretary-treasurer, Dr. O. C. Brown, Ft. Lauderdale. Delegates chosen were Drs. R. L. Elliston and Elbert McLaury.

It was voted to change the meeting date of the society to the second Wednesday of each month, and to meet jointly with the Staff of the Broward General Hospital for the duration of the war.

DADE

Dr. P. S. Pelouze, for many years Professor of Urology at the University of Pennsylvania, was guest speaker at a meeting of the Dade County Medical Society held at 8 p.m., December 10 at the Jackson Memorial Hospital.

DESOTO-HARDEE-HIGHLANDS-CHARLOTTE-GLADES

The DeSoto - Hardee - Highlands - Charlotte--Glades County Medical Society held its last meeting of 1942 at the Simmons Hotel, Wauchula, December 8. No scientific program was given, but the annual election of officers was held, which resulted as follows: president, Dr. M. C. Kayton, Wauchula; and secretary-treasurer, Dr. C. H. Kirkpatrick, Arcadia. It was decided to hold quarterly instead of monthly meetings for the duration, starting with January, 1943.

DUVAL

Dr. T. Z. Cason was installed as president of the Duval County Medical Society at a meeting held on the evening of December 1, and the following officers were elected: president-elect, Dr. J. G. Lyerly; vice president, Dr. W. H. Brooks; secretary, Dr. F. A. Copp, and treasurer, Dr. John A. Beals.

ESCAMBIA

At the annual election of officers held by the Escambia County Medical Society in December, the following were chosen to head the society for 1943: president, Dr. Alvyn W. White, Pensacola; vice president, Dr. John K. Turberville, Century; and secretary-treasurer, Dr. Lee Sharp, Pensacola.

Dr. P. S. Pelouze of Philadelphia was guest speaker at the November meeting of the society. His subject was "The Control of Gonorrhea."

HILLSBOROUGH

Dr. T. C. Maguire of Plant City was elected president of the Hillsborough County Medical Society at its annual meeting held in December. Other officers elected were: vice president, Dr. R. R. Duke, Tampa; and secretary-treasurer, Dr. James S. Grable, Tampa. Delegates to the 1943 State Association meeting will be Drs. H. Mason Smith, E. F. Shaver, B. W. Lowry, S. B. Forbes and W. M. Rowlett.

LEON-GADSDEN-LIBERTY-WAKULLA-JEFFERSON

A joint meeting of the Leon-Gadsden-Liberty-Wakulla-Jefferson County Medical Society and the Leon Society was held on November 27; Dr. P. S. Pelouze of Philadelphia was guest speaker. Dr. Pelouze, associate professor of Urology at the University of Pennsylvania, is a recognized authority on gonorrheal control and spoke on that subject.

MANATEE

At the December meeting of the Manatee County Medical Society, the following officers were elected: president, Dr. M. M. Harrison, Bradenton; vice president, Dr. J. F. Mason, Bradenton; and secretary-treasurer, Dr. L. W. Blake, Bradenton.

NASSAU

The Nassau County Medical Society met on the evening of November 30 at the Nassau County Health Department, with the following members present: Dr. George A. Dame, president; Dr. D. G. Humphreys, vice president; Dr. Ellsworth F. Waite, secretary, Dr. L. L. Bunker, Dr. H. B. Dickens, and Dr. Carl Lungerhausen.

Mr. E. R. Hood, chairman of the county hospital board, was a visitor and discussed the history of the planning, building and furnishing of the new Nassau County Hospital. He pointed out that the institution is well equipped for general surgery.

The Nassau County Medical Society is the latest affiliate of the Florida Medical Association.

PALM BEACH

Dr. P. S. Pelouze of Philadelphia, authority on gonorrheal control, was guest speaker at the meeting of the Palm Beach County Medical Society on the evening of December 10.

PASCO-HERNANDO-CITRUS

Dr. and Mrs. W. H. Walters of Lacoochee entertained the members of the Pasco-Hernando-Citrus County Medical Society at a quail dinner on Thursday evening, December 10.

At the scientific session which followed the dinner, clinical cases were reported by Dr. Walters, Dr. S. C. Harvard of Brooksville, and Dr. Claude L. Carter of Inverness. These cases were discussed by others present.

The annual election of officers was then held, which resulted as follows: president, Dr. W. Wardlaw Jones, Dade City; first vice president, Dr. Claude L. Carter, Inverness; second vice president, Dr. W. H. Walters, Lacoochee; secretary-treasurer, Dr. G. R. Creekmore, Brooksville. Censors: Dr. J. T. Bradshaw, San Antonio, for Pasco County; Dr. W. B. Moon, Crystal River, for Citrus County; Dr. S. C. Harvard, Brooksville, for Hernando County.

Dr. James L. Estes of Tampa was a guest of the Society at this meeting.

Dr. S. C. Harvard of Brooksville invited the society to meet at his home in January.

PINELLAS

A dinner meeting was held by the Pinellas County Medical Society on December 4, at which Dr. P. S. Pelouze of Philadelphia spoke on "The Clinical Aspects of Gonorrhea."

A round table discussion on "Gastrointestinal Malignancy" was held on December 18 at the home of Dr. C. S. Franckle. Dr. Franckle acted as moderator. The following resolutions were passed with respect to the death of Dr. George M. Lochner:

Whereas, it has pleased the Great Physician to call from our midst our friend and fellow-worker, Dr. George Mitchell Lochner, and

Whereas, his interest and presence will be continually missed in the meetings of our Society, be it

Resolved, that we, the members of the Pinellas County Medical Society, offer our profound sympathy and deep condolence to his bereaved wife and sister, and be it

Resolved, that a copy of these resolutions be sent to his wife, a copy be spread upon our minutes and a copy be sent to the Florida Medical Association.

POLK

Dr. T. G. Simmons of Auburndale was elected president of the Polk County Medical Society at its annual meeting at the Lake Region Hotel in Winter Haven on December 3. Other officers elected were: Dr. J. G. Gilchrist, Bartow, vice president; and Dr. Edgar Watson, Lakeland, secretary-treasurer.

Dr. P. S. Pelouze of Philadelphia was the principal speaker.

SEMINOLE

The regular meeting of the Seminole County Medical Society was called to order by the president, Dr. George H. Putnam, at 7:30 p.m., December 8, at the Fernald-Laughton Memorial Hospital, Sanford. Present were Drs. Putnam, Dame, Smith, Puleston, Langley, Garner, and Selman. Lieut. Com. (Jr.) Leonard (MC) of the Naval Air Base was a visitor.

A business meeting was held, during which resolutions were presented by Drs. H. D. Smith, W. T. Langley and W. H. Garner on the death of a former member, Dr. Clifford Morgan Mitchell. A motion was made, seconded and carried to send a copy of these resolutions to Mrs. Mitchell, the Sanford Herald and to the Florida Medical Journal.

The scientific program consisted of a paper on "Syphilis," presented by the president, Dr. G. H. Putnam. It was enjoyed by the society, and discussed by several members.

RESOLUTIONS ON DEATH OF DR. C. M. MITCHELL

Whereas, on October 5, 1942, Almighty God saw fit to remove from our membership Dr. Clifford Morgan

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OBSTETRICS—Formal and Informal Courses.

OTOLARYNGOLOGY—Two Weeks Intensive Course starting April 19. Clinical and Special Courses.

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Mitchell who was a charter member of our society, and

Whereas, we, as a profession have sustained a distinct loss in his passing, as has his wife, Mrs. Abbie Mitchell, together with his family and host of friends who mourn his passing; therefore be it

Resolved, that the Seminole County Medical Society extend to his widow and other relatives our sincerest sympathy and may Almighty God give them comfort.

Dr. Mitchell was loyal to his host of friends, never shirking anything for their comfort. He was a graduate of Emory University in the class of 1916. He practiced his profession for a time in Montezuma, Georgia, coming to Sanford about twenty-three years ago, where he continued in the profession until his passing. He was laid to rest in Evergreen Cemetery in this city. The services were conducted by the Rev. J. A. Tolle, pastor of the First Methodist Church, assisted by the Rev. Grantham of the First Christian Church.

Be it Resolved that a copy of these resolutions be mailed to his widow, Mrs. Abbie Mitchell, and a copy furnished the Florida Medical Journal for publication.

Signed by Committee:
H. D. Smith,
Theo. Langley,
Wade H. Garner.

ABSTRACT DEPARTMENT

Members of the Florida Medical Association who have had articles published in out-of-state medical journals are requested to forward such journals or reprints to Box 1018, Jacksonville, for abstracting in this department.

NASAL AND SINUS SURGERY; A CRITICAL REVIEW OF THE CAUSE OF UNSUCCESSFUL END RESULTS, HOLLENDER, A. R., MIAMI BEACH, SOUTH. M. J. **35**: 363-372 (APR.) 1942.

Based upon data obtained from questionnaires completed by 154 rhinologists, nasal surgical procedures effect a "cure" in 71 per cent of cases, and sinus surgical procedures in only 42 per cent. The causes of failure of nasal and sinus operations the author lists as follows: (1) incorrect diagnosis of the existing condition, (2) failure to take into account allergic factors or endocrinopathy, (3) lack of recognition of the role of organic diseases, such as diabetes, syphilis and tuberculosis, (4) hasty surgical intervention without adequate trial of nonsurgical treatment, (5) ill-performed or incomplete operation and (6) inadequate postoperative management.

The author stresses the importance of allergic factors being duly evaluated in each case before an operation is advised or undertaken. "The role of allergic factors in nasal and sinus conditions is now so prominent that even if the indications are positively surgical, the allergic aspect usually receives first consideration." He points out, however, that allergic treatment is often more successful if indicated surgical intervention has been followed out.

The author urges more detailed studies in each case to enhance the accuracy of diagnosis, with more careful selection of the patient for the operation as well as proper selection of the operation for the patient. He deplores the tendency of some rhinologists to "push" a certain type of operation because of personal preference rather than because of scientific rationalization. In addition to an allergic survey in each case, he believes the role of possible endocrine imbalance should be considered. The need for more rational application of surgery and for modifying classical operative technics in accordance with present knowledge of nasal physiology is stressed. Normal function should be preserved as far as possible. He notes that more adequate postoperative care may improve the surgical end result in some instances.

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MINUTE MAN FLAG

The Treasury Department has presented to the men and women of American Optical Company a Minute Man flag to be flown above the AO plant in recognition of their purchases of United States War Bonds.

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A representative of Daniel F. Doherty, state administrator for the sale of war bonds in Massachusetts for the Treasury Department, presented the flag to a delegation of AO people. Representing AO's management and employees, these people included George B. Wells, Ira Mosher, C. O. Cozzens, E. E. Williams, Bernard Fox, John Toomey, Helen Gray, Mary Costa, Fatina Costa, Theresa Bernier, Lorraine Champeau, Alice Spencer, Anna Laconto, and Victoria Sieczkowski.

BOOKS RECEIVED

Acknowledgment of books received will be made in this column and this will be deemed by us a full compensation to those sending them. A selection will be made for review as expedient.

HOW TO LIVE IN THE TROPICS. By Virginia Lloyd Hunt. Here is the first American handbook to cover fully the practical problem of living in the tropics. It packs into a small space every kind of useful suggestion. The author puts into the book not only the result of her own experiences, but that of doctors who have had many years of practice in tropical regions. She has had invaluable assistance from the health education departments of large organizations with field offices, and from staff members of the Rockefeller Foundation, Gorgas Institute, Pan American Union and Yale and Harvard Schools of Tropical Medicine. Cloth. Price, $2.00. Pp. 178. New York: Harcourt Brace and Company, 1942.

CONSTITUTION AND DISEASE; APPLIED CONSTITUTIONAL PATHOLOGY. By Julius Bauer, M. D., Professor of Clinical Medicine, College of Medical Evangelists, Los Angeles, Calif. The constitutional approach to medical problems is becoming more recognized. However, much of the discussion deals with general principles rather than with specific applications. Here is a preview of tomorrow's medical practice—a book that is different, in that it applies what is known of constitutional factors to individual patients as you see them in your office. Cloth. Price, $3.50. Pp. 220, with 5 illustrations. New York: Grune & Stratton, Inc., 1942.

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PRESIDENT'S MESSAGE

Dear Friends:

May I take this opportunity to wish for each of you a Happy New Year. While our thoughts and actions are keenly affected by the war, the greeting cannot be untinged. However, as we go about enriching the lives of those less fortunate than we, we shall find joy, and the year 1943 will be a happy year.

This year, because of the difficulty in traveling, no District Meetings were held. I feel the need of this contact with the different groups in the State. As your publicity chairman states, we need your cooperation more than ever this year. May I also urge upon you the necessity of good reports. Those of you who have not yet sent in your list of officers and chairmen are asked to do so, please.

I have one more request to make. Won't you try to have your Auxiliary contact the doctor's wife whose husband is in the service? A note from her own Auxiliary members will mean much even if she is at home.

May God grant us peace in the coming year.

Your State President,

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AUXILIARY PUBLICITY

To County Press and Publicity Chairmen:

The national chairman, Mrs. George H. Ewell, has requested a full report of each auxiliary meeting held in the state. Please follow the outline below in writing publicity for your local press, and send a copy to your state chairman not later that the 15th of each month. In order for our state to make a good showing, we must function as a county unit; each officer and chairman must do her part so that the state as a whole may be able to maintain a high standard and receive full credit from the National. I trust it will not be necessary to remind you again of your duty to your state auxiliary. Let us pull together and make this one of the best years in the history of our organization. We have a splendid president and she needs our cooperation and support. "Every auxiliary doing defense work," is one of our major objectives this year; your interest in your auxiliary is a test of your citizenship. Are you a good American? If so, give your president the fine backing she merits. Thank you.

Outline to follow:

(a) Name of county auxiliary
(b) Place of meeting
(c) Date of meeting
(d) Number present
(e) Name of speaker
(f) Subject of address
(g) Questions discussed
(h) Actions taken thereon
(i) Special projects undertaken
(j) Report how material sent by chairmen of committees of state auxiliary is used.

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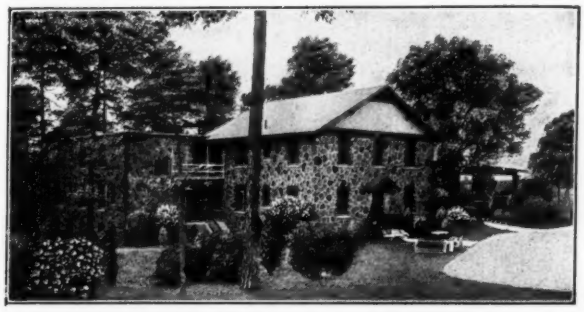

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STATE AND SECTIONAL MEETINGS

SOCIETY	PRESIDENT	SECRETARY	ANNUAL MEETING
Florida Medical Association	Gilbert S. Osincup, Orlando	Shaler Richardson, Jacksonville	Jacksonville, April 15-16, 1943
Florida Medical Districts:			
A—Northwest	Courtland D. Whitaker, Marianna	Stewart Thompson, Jacksonville	Tallahassee, Postponed
B—Northeast	L. Y. Dyrenforth, Jacksonville	" " "	Ocala, Postponed
C—Southwest	Edgar Watson, Lakeland	" " "	Sarasota, Postponed
D—Southeast	William Y. Sayad, W. Palm Beach	" " "	Miami, Postponed
Alabama Medical Association	H. B. Searcy, Tuscaloosa	D. L. Cannon, Montgomery	Birmingham, Apr. 20-22, 1943
Georgia, Medical Assn. of	James A. Redfearn, Albany	E. D. Shanks, Atlanta	Atlanta, May 11-14, 1943
Florida—			
Section, Am. College Phys.	R. H. Knowlton, St. Petersburg	Kenneth Phillips, Miami	To Be Announced
Dental Society, State	A. Malcolm Smith, D.D.S., Tampa	H. L. Cartee, DDS., Miami	
Derm. and Syph., Soc. of	Wiley M. Sams, Miami	Lauren M. Sompayrac, Jacksonville	To Be Announced
East Coast Medical Association	T. C. Kenaston, Cocoa	I. M. Hay, Melbourne	Postponed
Hospital Association	Mr. Ernest G. McKay, Tampa	Mr. R. L. Martin, St. Petersburg	Tampa—Postponed
Industrial Surgeons, Assn. of	Frank D. Gray, Orlando	Richard H. Walker, Orlando	To Be Announced
Medical Postgraduate Course	Turner Z. Cason, Jacksonville	Chairman	
Nurses Association, State	Mrs. Ann Thompkins, Leesburg	Miss Madalee Hazel, St. Petersburg	
Ophthal. & Otol., Soc. of	Shaler Richardson, Jacksonville	C. E. Dunaway, Miami	To Be Announced
Pathological Society	L. Y. Dyrenforth, Jacksonville	Iva C. Youmans, Miami	To Be Announced
Pediatric Society	Ludo von Meysenbug, Daytona B.	Robert Blessing, Ft. Lauderdale	To Be Announced
Pharmaceutical Association, State	Mr. Emmett L. Brown, Palatka	Mr. R. Q. Richards, Ft. Myers	
Public Health Association	W. H. Pickett, Jacksonville	Lloyd N. Harlow, Jacksonville	Postponed
Radiological Society	John N. Moore, Ocala	Walter A. Weed, Orlando	To Be Announced
Railway Surgeons' Association	Frank D. Gray, Orlando	W. C. Page, Cocoa	To Be Announced
Tuberculosis & Health Assn.	Mr. E. M. Newald, Orlando	Mrs. C. R. Whitaker, Eustis	To Be Announced
Chattahoochee Valley Med. Assn.	Herbert E. White, St. Augustine	Robert B. McIver, Jacksonville	Postponed
Gulf Coast Clinical Society	G. G. Oswalt, Mobile, Ala.	C. L. Rutherford, Mobile, Ala.	
S.E. Sec., Am. Cong. Phys. Ther.	John J. McGuire, Pensacola	Kenneth Phillips, Miami	
Southeastern Surgical Congress	Alton Ochsner, New Orleans	B. T. Beasley, Atlanta	Postponed
Southern Medical Association	Harvey F. Garrison, Jackson, Miss.	Mr. C. P. Loranz, Birmingham	To Be Announced
Suwannee River Medical Society	L. J. Arnold, Jr., Lake City	H. S. Howell, Lake City	

COMPONENT SOCIETIES BY DISTRICTS

	SOCIETY	PRESIDENT	SECRETARY	MEETING DATE	MEMBERS Total	MEMBERS Paid	COUNCILOR
A	Bay	J. Powell Adams, M.D. Panama City	J. O. Barfield, M.D. County Health Unit Panama City		11	4	
	Escambia *Santa Rosa*	Alvyn W. White, M.D. 24 W. Chase St. Pensacola	Lee Sharp, M.D. 24 W. Chase St. Pensacola	2nd Tuesday 8:00 P.M.	52	15	A-1-43 C. D. Whitaker, M.D. Marianna
	Franklin-Gulf		J. R. Norton, M.D. Port St. Joe	3rd Tuesday Odd Months	4	0	
	Jackson *Calhoun*	W. R. Wandeck, M.D. Marianna	R. N. Joyner, M.D. Marianna	2nd Tuesday 7:30 P.M.	12	1	
	Walton-Okaloosa	A. G. Williams, M.D. Lakewood	R. B. Spires, M.D. DeFuniak Springs	3rd Thursday 8:00 P.M.	6	0	
	Washington-Holmes	N. J. Dawkins, M.D. Vernon	B. W. Dalton, M.D. Vernon		6	1	
B	Columbia *Baker, Hamilton*	Harry S. Howell, M.D. Blanche Hotel Annex Lake City	Thomas H. Bates, M.D. Blanche Hotel Annex Lake City	1st Monday 7:30 P.M.	12	9	A-2-44 William D. Rogers, M.D. Chattahoochee
	Leon-Gadsden-Liberty-Wakulla-Jefferson	G. H. Garmany, M.D. Midyette-Moor Bldg. Tallahassee	B. A. Wilkinson, M.D. Telephone Bldg. Tallahassee	Quarterly 3:00 P.M.	39	11	
	Madison-Suwannee	Eustace Long, M.D. Madison	E. D. Thorpe, M.D. Madison		8	0	
	Taylor *Dixie, Lafayette*	J. C. Ellis, M.D. Perry	Chas. A. O'Quinn, M.D. Perry	Last Friday 8:00 P.M.	5	0	
	Alachua *Bradford, Gilchrist Union*	R. E. Summitt, M.D. 122 No. Pleasant St. Gainesville	Chester F. Ahmann, M.D. 1043 W. Masonic Gainesville	2nd Wednesday 7:30 P.M.	29	8	
	Duval *Clay*	T. Z. Cason, M.D. 2033 Riverside Ave. Jacksonville	F. A. Copp, M.D. 411 St. James Bldg. Jacksonville	1st Tuesday 8:15 P.M.	193	102	B-3-43 L. Y. Dyrenforth, M.D. Jacksonville
	Marion *Levy*	T. Hartley Davis, M.D. 202 Commercial Bk. Bldg. Ocala	B. F. Drake, M.D. Professional Bldg. Ocala	3rd Thursday 12:30 P.M.	28	18	
	Nassau	Geo. A. Dame, M.D. Fernandina	E. F. Waite, M.D. Fernandina	2nd Wednesday 8:00 P.M.	7	100%	
	Putnam	J. Worth Brantley, M.D. Grandin	C. M. Knight, M.D. Palatka	2nd Tuesday Even Months 7:00 P.M.	10	2	
	St. Johns	W. D. Webb, M.D. 220 St. George St. St. Augustine	Charles C. Grace, M.D. East Coast Hospital St. Augustine	3rd Tuesday 8:30 P.M.	12	4	
C	Brevard	G. T. von Colditz, M.D. Route 1 Cocoa	I. K. Hicks, M.D. Melbourne	3rd Wednesday	11	3	
	Lake *Sumter*	H. S. Cherry, M.D. Center Hill	R. H. Williams, M.D. County Health Unit Eustis	1st Thursday 12:30 P.M.	19	8	B-4-44 Meredith Mallory, M.D. Orlando
	Orange *Osceola*	T. E. McBride, M.D. Apopka	John A. Pines, M.D. 106 E. Central Ave. Orlando	3rd Wednesday 8:30 P.M.	93	40	
	Seminole	Geo. H. Putnam, M.D. Touchton Bldg. Sanford	Leland H. Dame, M.D. Co. Health Unit Sanford	2nd Monday 7:00 P.M.	12	4	
	Volusia *Flagler*	W. C. Pay, M.D. 221 W. Rich Ave. DeLand	R. L. Miller, M.D. 258½ S. Beach St. Daytona Beach	2nd Tuesday 7:30 P.M.	44	17	
	Hillsborough	T. C. Maguire, M.D. 104 S. Collins St. Plant City	James S. Grable, M.D. 811 Citizens Bldg. Tampa	1st Tuesday 8:00 P.M.	105	26	
	Manatee	M. M. Harrison, M.D. Professional Bldg. Bradenton	L. W. Blake, M.D. Bradenton	3rd Tuesday 7:00 P.M.	14	100%	C-5-44 Leland F. Carlton, M.D. Tampa
	Pasco-Hernando-Citrus	W. W. Jones M.D. Dade City	G. R. Creekmore, M.D. Brooksville	2nd Thursday 7:00 P.M.	11	1	
	Pinellas	W. C. McConnell, M.D. 313 First Federal Bldg. St. Petersburg	Annette M. Feaster, M.D. 166 Fourth Ave. N. E. St. Petersburg	1st and 3rd Fridays 6:30 P.M.	106	67	
	Sarasota	O. H. Cribbins, M.D. 138 N. Link Sarasota	A. O. Morton, M.D. Commercial Court Sarasota	2nd Tuesday 8:30 P.M.	19	9	
D	DeSoto-Hardee-Highlands-Charlotte-Glades	M. C. Kayton, M.D. Wauchula	C. H. Kirkpatrick, M.D. Box 454 Arcadia	Quarterly	20	3	
	Lee *Collier, Hendry*	H. Quillian Jones, M.D. 18 Leon Bldg. Fort Myers	W. H. Grace, M.D. Box 907 Fort Myers	3rd Tuesday 7:30 P.M.	17	6	C-6-43 Edgar Watson, M.D. Lakeland
	Polk	T. G. Simmons, M.D. Corlett Bldg. Auburndale	Edgar Watson, M.D. Box 1021 Lakeland	2nd Wednesday 1:00 P.M.	59	18	
	Palm Beach	O. B. Hazen, M.D. Comeau Bldg. W. Palm Beach	D. W. Martin, M.D. 618 Comeau Bldg. W. Palm Beach	4th Monday 8:00 P.M.	69	18	D-7-43 William Y. Sayad, M.D. West Palm Beach
	St. Lucie-Okeechobee-Indian River-Martin	R. C. Boothe, M.D. Box 408 Ft. Pierce	Adrian M. Sample, M.D. Box 176 Ft. Pierce	3rd Thursday 8:00 P.M.	17	6	
	Broward	D. W. Harris, M.D. 420 Sweet Bldg. Ft. Lauderdale	O. C. Brown, M.D. 915 Sweet Bldg. Fort Lauderdale	2nd Wednesday 8:00 P.M.	41	14	D-8-44 Elbert McLaury, M.D. Hollywood
	Dade	H. L. Pearson, M.D. 416 Ingraham Bldg. Miami	Wiley M. Sams, M.D. 305 Ingraham Bldg. Miami	1st Tuesday 8:30 P.M.	311	131	
	Monroe	Harry C. Galey, M.D. 532 Fleming St. Key West	W. R. Warren, M.D. 511 Eaton St. Key West	1st Sunday 9:00 P.M.	5	0	

*Supervise and aid until organized separately.

In the past a frequent complaint from mothers was the expense incurred when the large bottle of antiricketic was accidentally upset.
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"Busy fingers"

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Even if the bottle of Mead's Oleum Percomorphum is accidentally tipped over, there is no loss of precious oil nor damage to clothing and furnishings. The unique Mead's Vacap-Dropper* is a tight seal which remains attached to the bottle, even while the antiricketic is being measured out. Mead's Vacap-Dropper offers these extra advantages also, at no increase in price:

Unbreakable

Mead's Vacap-Dropper will not break even when bottle is tipped over or dropped. No glass dropper to become rough or serrated.

No "messiness"

Mead's Vacap-Dropper protects against dust and rancidity. (Rancidity reduces vitamin potency.) Surface of oil need never be exposed to light and dust. This dropper cannot roll about and collect bacteria.

Accurate

This unique device, after the patient becomes accustomed to using it, delivers drops of uniform size.

No deterioration

Made of bakelite, Mead's Vacap-Dropper is impervious to oil. No chance of oil rising into rubber bulb, as with ordinary droppers, and deteriorating both oil and rubber. No glass or bulb to become separated while in use.

**Supplied only on the 50 c.c. size. the 10 c.c. size is still supplied with the ordinary type of dropper.*

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Oleum Percomorphum 50% is now known as Oleum Percomorphum 50% With Viosterol. The potency remains the same; namely 60,000 vitamin A units and 8,500 vitamin D units per gram. It consists of the liver oils of percomorph fishes, viosterol, and fish liver oils, a source of vitamins A and D in which not less than 50% of the vitamin content is derived from the liver oils of percomorph fishes (principally Xiphias gladius, Thunnus thynnus, Stereolepis gigas, and closely allied species).

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